WMed
A1

TRANSACTIONS

OF THE

Thirty-second Annual Meeting

OF THE

AMERICAN LARYNGOLOGICAL ASSOCIATION

HELD AT

370691
28.8.39

WASHINGTON, D. C.

May 3rd, 4th and 5th, 1910.

NEW YORK
PUBLISHED BY THE ASSOCIATION
1910

RF
1
A5
V.32

THE McCONNELL PRINTING CO.,
230-242 William Street, N. Y.

PRESIDENTS OF THE ASSOCIATION

(Year of Election.)

1879. LOUIS ELSBERG, M.D.
1880. J. SOLIS-COHEN, M.D.
1881. FREDERICK I. KNIGHT, M.D.
1882. GEORGE M. LEFFERTS, M.D.
1883. FRANCKE H. BOSWORTH, M.D.
1884. ERNEST L. SHURLY, M.D.
1885. HARRISON ALLEN, M.D.
1886. E. FLETCHER INGALS, M.D.
1887. RUFUS P. LINCOLN, M.D.
1888. E. CARROLL MORGAN, M.D.
1889. JOHN N. MACKENZIE, M.D.
1890. WILLIAM C. GLASGOW, M.D.
1891. SAMUEL W. LANGMAID, M.D.
1892. MORRIS J. ASCH, M.D.
1893. D. BRYSON DELAVAN, M.D.
1894. JOHN O. ROE, M.D.
1895. WILLIAM H. DALY, M.D.
1896. CHARLES H. KNIGHT, M.D.
1897. THOMAS R. FRENCH, M.D.
1898. WILLIAM E. CASSELBERRY, M.D.
1899. SAMUEL JOHNSTON, M.D.
1900. HENRY L. SWAIN, M.D.
1901. JOHN W. FARLOW, M.D.
1902. JOSEPH H. BRYAN, M.D.
1903. JACOB H. HARTMAN, M.D.
1904. CLARENCE C. RICE, M.D.
1905. JOSEPH W. GLEITSMANN, M.D.
1906. ARTHUR W. de ROALDES, M.D.
1907. HERBERT S. BIRKETT, M.D.
1908. ALGERNON COOLIDGE, Jr., M.D.
1909. JAMES E. LOGAN, M.D.

OFFICERS

(Elected June 2, 1909.)

PRESIDENT.

JAMES E. LOGAN, M.D., Kansas City, Mo.

FIRST VICE-PRESIDENT,

CORNELIUS G. COAKLEY, M.D., New York City.

SECOND VICE-PRESIDENT,

HARRIS P. MOSHER, M.D., Boston, Mass.

SECRETARY AND TREASURER,

JAMES E. NEWCOMB, M.D., New York City.
118 West 69th St.

LIBRARIAN,

JOSEPH H. BRYAN, M.D., Washington, D. C.

COUNCIL,

THE ABOVE EX-OFFICIO AND

JOSEPH W. GLEITSMANN, M.D., New York City.
ARTHUR W. de ROALDES, M.D., New Orleans, La.
HERBERT S. BIRKETT, M.D., Montreal, Canada.
ALGERNON COOLIDGE, Jr. M.D., Boston, Mass.

TABLE OF CONTENTS

PAGE

Address of the President. JAMES E. LOGAN, M. D. 1

Papers.

I. Black Tongue: Lingua Nigra Villosa. CHARLES H. KNIGHT, M. D. 8

II. A Case of Laryngeal Syphilis with a Description of the Difficulties of Differential Diagnosis. HARMON SMITH, M. D. 16

III. Observations on the Variety of Germs Present in Wounds Following Operations on the Faucial Tonsils. ALEXANDER W. MACCOY, M. D. 22

IV. Report of Three Cases of Lympho-Sarcoma of the Naso-Pharynx and Tonsils. CLEMENT F. THEISEN, M. D. . 24

V. Ozena and Respiratory Gymnastics. MARCEL NATIER, M. D. 28

VI. Transplantation of Rib Cartilage Into the Nose in a Case of Nasal Deformity. D. CROSBY GREENE, JR., M. D. 40

VII. Syphilitic Stenosis of the Oro-Pharynx. JOHN M. INGERSOLL, M. D. 44

VIII. Supplemental Report on Operations on Malignant Growths of the Upper Air Tract. J. PRICE-BROWN, M. D. . 50

IX. An Instrument for Direct Intubation of the Larynx. HARRIS P. MOSHER, M. D. 52

X. The Nasal Phenomena of Neurasthenia. CHARLES P. GRAYSON, M. D. 57

XI. Exostoses of the Accessory Sinuses. HARRIS P. MOSHER, M. D. 64

XII. A Preliminary Report of Intranasal Decompression in a Case of Tumor of the Hypophysis. NORVAL H. PIERCE, M. D. 73

XIII. Quininae and Urea Hydrochlorate—Hydrochlorate as a Local Anesthetic. E. FLETCHER INGALS, M. D. . . 78

XIV. Esophageal Diverticuler. EMIL MAYER, M. D. . . 85

Joint Session with the American Climatological Society and the American Otological Society: Papers by Fellows of the American Laryngological Association.

PAGE

XV. First Paper: The Value of Vaccine Treatment of Chronic Inflammatory Disease of the Accessory Sinuses of the Nose. HERBERT S. BIRKETT, M. D., and J. C. MEAKINS, M. D. 94

XVI. Second Paper: Experience in the Use of Vaccines in Chronic Suppuration of the Nasal Accessory Sinuses. CORNELIUS G. COAKLEY, M. D., and A. I. KENDALL, Ph. D. 105

XVII. Third Paper: Experience with the Use of Vaccines in Diseases of the Nose and Throat. FREDERIC C. COBB, M. D., and E. W. NAGLE, M. D. 112

XVIII. History of a Case of Recurrent Papilloma of the Larynx. FRANCIS R. PACKARD, M. D. 117

XIX. Influence of the Use of the Automobile upon the Upper Air Passages. D. BRYSON DELAVAN, M. D. . . 126

XX. The Manifestations of Recurrent Influenza on the Nose and Throat. JOSEPH L. GOODALE, M. D. . . . 139

XXI. Diagnosis of Peridotal Cysts of the Superior Maxilla. NORVAL H. PIERCE, M. D. 149

XXII. Case Reports Illustrating Ocular Affections Due to Intra-Nasal and Accessory Sinus Disease. LEWIS A. COFFIN, M. D. 156

XXIII. The Cutting in Two of a Large Steel Pin While Transfixed in the Left Bronchus and Its Removal by Lower Bronchoscopy. W. E. CASSELBERRY, M. D. . . . 176

XXIV. Epithelioma of the Left Vocal Cord. CHARLES W. RICHARDSON, M. D. 189

XXV. A Fatal Case of Asphyxia Due to Pressure on the Trachea and Bronchus by a Tuberculous Mediastinal Gland. CORNELIUS G. COAKLEY, M. D. . . . 196

XXVI. Exhibition of Anatomical Preparations Demonstrating Communications Between the Blood Vessels Supplying the Dura, the Orbit and the Nasal Chambers. GEORGE E. SHAMBAUGH, M. D. 206

XXVII. Some Points in the Comparative Anatomy of the Larynx in the Anthropoidea. J. GORDON WILSON, M. D. . . 209

PAGE

XXVIII. The Syndrome of the Sphenopalatine-Ganglion Neurosis. GREENFIELD SLUDER, M. D. 234

New Instruments and Specimens 246

Business Meeting 248

Obituary:—DR. GORDON KING. 257

Presentation of Loving Cup to DR. J. SOLIS-COHEN. Address by D. BRYSON DELAVAN, M. D. 260

Reply by DR. COHEN 265

List of Active Fellows, 1911 269

Honorary Fellows 272

Corresponding Fellows 272

Past Officers 274

Past Members 276

TRANSACTIONS OF THE THIRTY-SECOND ANNUAL MEETING OF THE AMERICAN LARYNGOLOGICAL ASSOCIATION.

HELD AT WASHINGTON, D. C.,

MAY 3, 4 AND 5, 1910.

THE PRESIDENT'S ADDRESS.

BY JAMES E. LOGAN, M.D., KANSAS CITY, MO.

Fellows of the American Laryngological Association:

I count it high honor to be your presiding officer of this, the thirty-second annual meeting of the Association, an honor, however, of which I feel myself most unworthy, when I call to mind the names of those who have occupied this chair before me.

We, and the suffering world with us, owe much to the brains and the tireless labors of these, my predecessors, and had I the time and the requisite ability it would give me great pleasure to recall to your memories in detail some of the achievements of these epoch-making pioneers. They brought to the front and into the light this hitherto obscure branch of surgery, and gave the initial impulse that led to its phenomenal after-development.

No one can dispute this claim, nor take from them the glory of having originated many of the ideas which are the commonplaces of to-day, and for which, in consequence, they do not always receive due credit.

We who sat in that great Congress that met last year in Budapest must all have felt our hearts beat high with pride as we listened to papers read there by men of all nations, and recognized everywhere, in those reports of work accomplished, the influence of these founders of our association.

That influence began as a local affair, but it has grown to be a part, and no small part, of the general fund of knowledge from which the professional worker abroad as well as at home can and does draw at will.

It is hard even for us to realize the primitive conditions that confronted the profession no longer ago than the late seventies, when this organization had its birth, and so it is not easy to measure the astonishing strides that surgery, especially rhino-laryngological, has made since. In its present status the cause appears inadequate to the tremendous effect produced. But that is Nature's way. Her efforts seem universally to be discontinuous, uneven, vibratory. Always and everywhere progress proceeds by leaps. There are times of sterility and times of growth in the mental as well as in the physical world, and we should think ourselves extremely lucky to have followed the seed-sowers and to have been permitted to do our own life-work in a fruit-bearing season of humanity's year.

As fellows of this society then, we have every reason to be proud of the names inscribed upon our rolls from the beginning, and it is only the plainest of duties to see to it that this lofty standard is maintained.

To assist in the fulfillment of this part of our obligation, the Judicial Council at its meeting last January decided to recommend some changes in the methods governing the admission of new associates. Heretofore it has been our custom to vote impartially upon every name presented, and year after year the same names come before us with unvarying regularity, only to be unfailingly refused.

Now these gentlemen are in no sense applicants for membership in this body. In some instances, I have no doubt, they are even unaware that they are subjects of discussion. It is manifestly unfair then to put upon them this stigma of continued rejection. We have therefore concluded to erase all names from this old list; to clean the slate and start afresh. In the future no one should be considered unless he is vouched for by at least one member of this Association, who has himself *personally* investigated the professional attainments and *other* qualifications of his candidate. I wish earnestly to ask each and every one of you then to proceed with the utmost caution in this delicate

matter. Before nominating a new Fellow, let us take the trouble to make sure that his character, his ability and his special achievements fit him for the honor, and that if elected he will add to our working strength, and not handicap the ranks. It would be worse than useless to increase our members at the expense of the quality of the new material. At best it is fatally easy to drop to lower levels. It is desperately hard to hold a height we have ourselves won; so much more difficult to cling to one to which we have largely succeeded.

In the struggle to keep abreast of the ever-mounting intellectual tide, we cannot afford to scorn even the smallest and most adventitious aid. For this and other reasons I consider the decision of our Congress to hold every third meeting in the National Capital most wise.

We stand here on neutral ground. This is the one spot that belongs equally to us *all*. Here, if anywhere, we cease to be Northern or Southern, Eastern or Western. We come together simply as Americans. This common citizenship, this feeling of equal ownership, has a tendency to broaden our views, to take away the provincial narrowness from which none of us is wholly free. But considerable as is this advantage, there is something more.

In the entire length and breadth of these United States of ours, Washington is the one *great* city that is not *openly* dedicated to commercialism. The trail of the serpent is visible here, no doubt—in this era the money-god has nowhere left himself without his witnesses. But at least we *can* say, that here he does not build his gorgeous temples. We do not find his name emblazoned upon the *fronts* of the gleaming palaces that surround us.

It is something—*I* think it is much—to be able to escape even for a brief space the heavy atmosphere of the sordid plain on which we pass our workaday lives, and get a few whiffs of the more stimulating ozone that comes from the heights of impersonal—I dare not say wholly *unselfish* endeavor.

In common parlance we speak of ideas as being in the air. By this we mean, when we happen seriously to mean anything by the phrase, that thought is a force, a very real and potent force, which, like other forces, has its governing laws, its conditions of expression and its peculiar media of transmission.

If this be true (and who can doubt it?) then it may not be too fanciful to suggest that here, if anywhere, the thought-currents of the whole nation converge and find a center.

In this beautiful city, dedicated no less to art and to learning than to the more practical concerns of the common weal, we ought to be able to find inspiration that will help us keep our individual ideas higher and our energies keener in the deadening grind which is our usual portion.

In passing, I alluded to the unprecedented rapidity which has characterized the evolution of Rhinology and Laryngology. We may congratulate ourselves to-day that from its timid and modest beginning of thirty odd years ago, our department has shot upward until now it stands shoulder to shoulder with the older branches of the profession. This advance has been most notable during the last decade, and the explanation is not difficult.

Previous to that time we were finding ourselves. Our efforts necessarily were more or less tentative. We were, so to speak, groping along an untried way, and the light that glimmered ahead of us was not always clear enough or steady enough to keep our steps from straying into seductive side paths which fuller experience has shown lead no-whither. Before we could make much real progress it was necessary to face about and plant our feet firmly on the straight and extremely arduous road, which we trust will eventually bring us within measurable distance of the goal.

In their incipiency Rhinology and Laryngology were regarded as component parts of the wide field of general medicine, which had merely been marked off and partially enclosed for the greater convenience of such students as might wish to pursue intensive methods. There was no thought of vital difference in the treatment of diseases of the upper respiratory tract and those of other portions of the organism.

For years rhinologists continued to prescribe systemic medication for and make topical applications to diseased tissues of the nose and naso-pharynx.

But, fortunately, we best learn to do by *doing*, and it was finally borne in upon us that something was lacking, and that if we wanted results we must change our tactics.

It had come to be recognized that the two main functions of

the nasal cavities and the naso-pharyngeal space were respiration and drainage. And the corollary naturally imposed itself, that nothing must be allowed to interfere with the free and proper performance of these essential duties. It was, of course, plainly seen that congenital deformities and traumatisms of childhood, as well as accidental injuries in adult life, produce conditions that render respiration imperfect and prohibit drainage.

Then, as investigation along this line became more minute and critical, we began to realize that the glandular tissues found in the vault and in the pharynx are much more than obstructions to functional activity. They are veritable culture beds for infections, infections that spread not alone to the neighboring areas of the nose and throat, but to the whole system. Thus they become responsible for many diseases that heretofore we had considered dependent upon constitutional dyscrasia, and had treated medicinally.

So it came to pass that the rhinologist of not so many years ago who had begun his career with the idea that he had done his full duty as a specialist when he had thoroughly cleaned and sprayed the mucous membranes, saw himself forced to resort to the knife and cautery to remove extraneous growths and reduce malformations. Suddenly the physician had become a surgeon.

The immediate results of this change of method were so brilliant as almost to be startling. For a time it looked as if the age of miracles had returned and that nothing was impossible to him who had enough faith in his own skill and enough courage to take the chances.

It is scarcely to be wondered at that enthusiasm over this unparalleled success has led to radicalism in some quarters, and that the knowledge of etiology and pathology has not progressed in equal measure with dexterity of manipulation.

This is deeply regrettable. Certainly I do not undervalue the good that has come and will continue to come from necessary operations. But I know, as do you, that no permanent advance can be made without patient, painstaking research into causation and pathology. Rhino-Laryngology is a science—a most exacting and intricate science. It demands from its practitioner the closest study into the history of every case that is presented to him. The human body is one. In health or in disease the organs

are interdependent, and causation does not necessarily lie upon the surface. To know our own department thoroughly it is imperative to have more than a superficial acquaintance with the whole field of medicine.

I am well aware that these are the tritest of commonplaces, but occasionally it is useful to remind ourselves and each other that there is still truth, *vital* truth, in the worn out texts. I see, or think I see, clearly that of late there has come a widespread reawakening to these facts, and the suspicion is evidently gaining ground that we have left undone some things we ought to have done, even if we are not yet prepared to admit that we have done a few things better left undone.

But, happily, there is still robust health in us, and extremes react upon each other and adjust themselves naturally. The pendulum is certainly veering toward the safer side, and conservatism is coming to its own again.

The rhinologist will not cease to be a surgeon, but he will become a pathologist as well, and thereby double his usefulness. The day is not distant when the general practitioner will be forced to call upon the specialist for aid in extirpating the pernicious culture beds where now the seeds of diphtheria, eruptive fevers and kindred diseases germinate unsuspected and unhindered.

As encouragement to closer study and deeper research, such funds as that recently established by Dr. Roaldes have great utility, and it is to be wished that his good example will find many followers.

Since our meeting a year ago one member has resigned from the Association, and a most untimely death has carried off our colleague, Dr. Gordon King. We realize that death is part of the general scheme of life, and when it comes in extreme age, it comes in friendly guise. But the accident that cut short the brilliant and useful career of Dr. King seems a cruel fatality. He had already accomplished much, but he had the right to expect long years to come, in which to do many other things which his talents and his enthusiasm would have made an easy task. In losing him, therefore, this society loses much of present strength, but more of future promise.

Our sympathy goes out in full measure to his bereaved family

and personal associates, and most especially to our beloved co-worker, Dr. Roaldes. To him this, our common loss, comes as a crushing blow.

I suggest that a committee be appointed to draft suitable resolutions, which will convey to the relatives and close friends the expression of our deep regret and sincere sympathy.

Our secretary, Dr. Newcomb, has been ill during much of the past Winter, and it gives me great pleasure to note his recovery. His sufferings have in nowise impaired his efficiency, and he has permitted nothing to interfere with the faithful performance of the onerous duties of his office.

He has prepared for us a full and varied programme, and in all ways has earned our grateful appreciation.

Our hearty thanks are also due to the fellows of the Association residing in Washington, and in particular Dr. Richardson and Dr. Bryan. They have spared neither time nor trouble to make this a successful and altogether delightful meeting.

If the wheels of the machine turn smoothly we shall owe the lack of friction in large measure to their kindly efforts.

Gentlemen, I thank you for your courteous attention and ask you to consider the regular programme which is now before you.

BLACK TONGUE: LINGUA NIGRA VILLOSA.

With Report of a Case

BY CHARLES H. KNIGHT, M.D., NEW YORK.

The ease with which the chief feature of *nigrismus linguae* may be simulated by means of certain pigments, iron applications, etc., has prompted the statement that most instances of alleged "black tongue" are cases of intentional deception, or malingering (Hutchinson). Genuine examples are now numerous enough to exclude this assumption, except perhaps in hysterical young women. The condition seems to have been first fully described by Landouzy in 1845, although the observation of a case is credited to Lusitanus in 1557. In a very complete report by Blegvad in 1907 reference is made to a contribution by Rayer bearing the date 1835. He collected 138 cases, including ten of his own, and at the end of the present paper a few cases are added not found in his list.

The clinical history is not a matter of controversy, but the gross appearances and the microscopic picture are differently interpreted by various observers. By some it is regarded as a vasomotor disturbance allied to chromidrosis of the skin (Armaingaud). The suggestion is offered by S. Solis-Cohen that the subjects of this condition belong to that class of vasomotor defectives who often show a proneness to deposit of pigment in areas exposed to irritation, or in which the blood current is for a time slowed. He regards it as "a local proliferation, probably excited by the presence of microbes," the latter not necessarily specific. He discovers no connection with gastric disorders, or with systemic infection. The tendency has been to accept a parasitic origin, although the micrococcus, described by Raynaud (1889), is always found about the filiform papillae and forms a large constituent of the natural fur (Butlin, 1885). From a study of two cases in healthy women, from 50 to 70

years of age, Carl Böcher (1887) concludes that micro-organisms are the causative factors, since he found the affected papillae buried in a granular mass entangling mycelial threads and many spores. Fairlie Clarke (1872) quotes Hyde Salter (1852) as referring to cases in which the filiform papillae are enormously elongated and of a dark sepia color, due to pigment granules, but he himself offers no opinion as to cause. The name *mucor niger* has been applied by Ciaglinski and Hewelke (1893) to an organism found in the scrapings of a lesion and believed to be the etiological factor. A similar organism was discovered by Sendziak (1894). A black mould found and cultivated by Schmiegelow (1896) is regarded by him as pathogenic. On the contrary, Schech (1887), who at first espoused the parasitic theory, now adopts the idea of *hyperkeratosis*, the papillae being enlarged and cornified, in which he is followed by Brosin (1888). A similar opinion is held by Haenisch (1908), who, after a careful review of the pathological anatomy and etiology of black tongue, holds that the fungi occasionally found have no etiological importance whatever. The microbic idea is rejected by Wyatt Wingrave, after examination of a case exhibited by Abercrombie (1901), that of a man of 32, whose attention was drawn to his tongue by persistent tickling in the roof of his mouth and a peculiar sweetish taste. In the scrapings from a black patch in the usual situation were found a large variety of bacteria commonly occurring in the mouth, the hair-like appearance being attributed to cleaving of the papillae with keratinoid degeneration and pigmentation of the cells. Similar results in six other cases confirmed these conclusions.

After a very critical analysis of his own cases (ten) and of the literature of the subject, Blegvad (1907) decides that the parasitic theory is not tenable. He finds no difference microscopically between black tongue and the ordinary furred tongue, and quotes Müller and Fuchs, who distinguish two varieties of furred tongue. In one the fur is made up of epithelial debris, leucocytes, moulds, food particles, etc.; the other kind, more likely to be confounded with black tongue, is composed of keratosed, elongated filiform papillae. His attempts to cultivate the mould scraped from the tongue in each of his cases developed many colonies of bacteria, but no brown or black moulds.

Although his microscopic examinations, as well as most of those of others, have been limited to the papillae and have not included deeper structures, where more positive signs of inflammation might be seen, he believes that the lesion begins as a slight glossitis or stomatitis resulting in prolongation of the papillae, which afterwards become discolored by contact with certain ingesta, or by drugs taken internally and eliminated by the mouth. He found it neither infectious nor inoculable, and all experiments by others in this direction have failed. He also combats the hyperkeratosis theory, maintaining that "papillae from normal tongues on an average are just as much keratosed as those from black tongues." The researches of J. L. Goodale (1900), which included underlying tissue together with affected papillae, seem to prove that the lesion is primarily a glossitis and that alterations in the epithelial cells are secondary. The color is thought to be due to the presence of certain "highly refractile pigmented granules" associated with a "characteristic bacterium." From being a personal experience the case of H. Arrowsmith (1909) has peculiar interest. He accepts the non-parasitic view, as implied in the term hyperkeratosis, which is still further established by microscopic examination of excised papillae made by Archibald Murray. Two points in his history are noteworthy; first, the location of the patch quite to the left instead of, as usual, in the median line; and second, its spontaneous disappearance in about ten days.

Subjective symptoms are entirely absent, or may be limited to a localized feeling of dryness, or tickling, or of a foreign body. For this reason, probably, the condition is not often observed. In one of two cases reported by R. H. Johnston (1903) a *sticking* sensation in the tongue was complained of, but otherwise nothing extraordinary was noted. Nothing especial attracts the attention of the patient, and its discovery is often quite accidental. The affection has only an academic interest, both for the foregoing fact and because treatment seems to have little or no effect. Gradual extension of the staining over a limited area, or even to the whole dorsum of the tongue, followed by slow spontaneous fading from the periphery toward the center, has been the general experience. The staining is totally different in character from the melanotic spots sometimes seen in the buccal cavity in Addison's disease, in conjunction with the characteristic bronzing of

the skin. Butlin asserts that most cases are in poor general health, and that tonics are indicated, although he is not very enthusiastic about the result of any kind of treatment. Of three cases described by Lannois (1888) one occurred in a young girl with Pott's disease, one in an old tabetic subject, and one in a man of 62 with dysentery. Black tongue is said to be frequently developed in diabetes (Horand and Weil, 1888). Leviseur (1889) reports a case in a syphilitic and expresses the belief that it is most frequent in those debilitated by age or disease. Certainly the records seem to sustain the idea of a probable constitutional element. The sense of taste and of touch and the motility of the tongue are not affected. On the other hand, Schech affirms that disturbance of the sense of taste may lead the patient to consult a physician. The latter authority also refers to the etiologic theory of Dessois that the affection is caused by a special fungus (*glossophyton*) not otherwise found on the tongue (?). In some cases the sense of taste is said to have been actually exaggerated, and even painful.

The duration of the disease is extremely variable, from a few days to fifteen years (Sell, 1897 and 1885). Lambert Lack mentions a case having persisted "some years." Others have been known to terminate within a few weeks. The majority of cases have been noted in young people. In one cited by Butlin, a woman of 83, the hair-like papillae loosened and fell off at the end of about a year. Desquamation is said to be common and relapses are not infrequent. In one of several cases seen by George Stoker (1890) the subject was a little child, who was also the victim of certain specific throat manifestations. A case reported by Rydigier (1891) was only 14 years of age, while Delefosse and Sahlé (1908) observed a case in a nursling.

Aside from the distinctive color the area involved has a curious tufted, shaggy appearance, owing to lengthening of the papillae and their hair-like prolongations. The picture is likened by Schech (1887) to the "nap of a black silk hat rubbed the wrong way." His examination convinced him that the disease is not a mycosis, but is composed simply of hypertrophied, pigmented and horny papillae. With finer fancy Raynaud compares it to "a field of corn laid by the wind and rain." In the majority of cases a single patch is seen in the middle line of the tongue in

front of the circumvallate papillae, but Grünwald (1903) describes and figures a case in which the patches were multiple, from light brown to black in color and produced, in his opinion, by hypertrophic cornification and pigmentary degeneration of the filiform papillae. As to the color, while as a rule it is decidedly black, it may be light brown, or even blue or green. Changes in color may take place if the patch persists, and sometimes it looks simply like a white fur of unusual degree. In this connection it is interesting to note the fact, to which attention has been called by Butlin, that bacteria possess a remarkable capacity for assuming various tints. While they may have no other relation to the lesion, it is possible that they have some bearing upon this phenomenon.

Treatment, if considered necessary at all, is of doubtful efficacy. It is hard to place a just estimate on medication in a disease that is known to subside spontaneously. In one case reported by Masters and Smith (1891) recovery was complete in three weeks without treatment, and in another a cure seems to have been effected in a few days by the internal use of a mixture of nitric acid and nux vomica and a mouth wash of lemon juice. In Arrowsmith's case the patch disappeared in ten days without treatment and there has been no return. The local use of a five per cent. solution of salicylic acid mixed with a five per cent. collodion solution followed by frequent applications of hydrogen peroxide was employed with success by Semon (1897) in accordance with a suggestion made by Unna. Brosin refers to a cure resulting from chlorate of potash gargling and mentions another case relieved by curetting (Genzner). Altogether, unless to ease the mind of the patient, there seems to be no reason for an energetic attack. The disease is perfectly innocuous in its course and consequences, so that any apprehension of malignity may be dismissed. It may appear in either sex or at any period of life. Of the cases on record a large proportion have been under middle age and the male sex largely predominates, a fact perhaps explained by the habitual use of tobacco.

At the present time there is no evidence pointing to the existence of a causative organism. In fact the question of etiology remains unsettled. The history of this phase of the subject is interesting, if fruitless, and is a striking commentary on the pro-

pensity of the human mind to draw false conclusions from what the eye is supposed to see. No less than fifty different kinds of bacteria have been found in the mouth. All of these have been seen in perfectly healthy mouths, not one has been detected invariably present in black tongue, and their proportion bears no relation to the extent or intensity of the lesion. All of which would seem to dispose of the parasitic theory. The effects of mouth-breathing, of the immoderate use of tobacco, of chemical changes in the saliva have been given importance in accordance with the standpoint of the observer, but are still undetermined. As a matter of fact some cases have been mouth-breathers and others not, some have been users of tobacco and others abstainers, while as to associated change in the character of the saliva it is quite as reasonable to suppose that it is dependent upon the same cause that is responsible for the tongue condition as that the former causes the latter.

The following case answers the description given by nearly all who have written on the subject:

The patient is a gentleman of middle age, of good habits and health, but of rather nervous temperament. He is more or less catarrhal, but the buccal secretions seem to be normal, and he has exceptionally good teeth. His digestion is good and he is reasonably careful in his diet. He is an immoderate smoker, but never drinks to excess. There is no history of gout or rheumatism. It is impossible to discover a local or a constitutional cause of the condition. Many months, perhaps a year ago, he was startled by seeing a black spot on the middle of his tongue near its base. As it gave him no unpleasant sensation he paid but little attention to it. Looking at it at long intervals he found it was slowly spreading. At the present time it is about the size of a silver dollar and extends from just in front of the circumvallate papillae almost symmetrically on either side of the median line. It is black at the centre and becomes brownish at the circumference. The papillae composing it are much longer than normal and are so attenuated at their ends as to resemble coarse black hairs. On separating the papillae with a probe their bases are seen to be of lighter color, reminding one of wet chamois skin. The patch is moist and there is no apparent deficiency of saliva. There is absolutely no sensitiveness and the contact of the probe is instantly appreciated. The sense of taste is not in the least impaired. The only subjective symptom is a sensation of dryness and, as the patient expresses it, "food seems to adhere in the act of swallowing." Not sharing my scientific interest, he would not

permit a microscopic examination of the papillae. It is not likely, however, that anything can be added to what has already been done in this line by Blegvad, Goodale, Wingrave and others. He was given a two per cent. watery solution of protargol with which to paint the patch once a day, and was directed to rinse the mouth thoroughly with borolyptol after eating. He reports that the stain gradually faded until within a month no trace remained, although he obeyed instructions only as regards cutting down his use of tobacco.

While the preceding recital adds nothing of value to the history or pathology of "black tongue," it may serve the purpose of calling renewed attention to the etiologic importance of the vasomotor system. In our quest for germs and in our study of the internal secretions the role played by the nerves in the causation of certain elusive and obscure affections may have been neglected. It is not unreasonable to suppose that each of these factors is concerned to a greater or less extent in every pathological state. The difficult matter in a given case is to decide which predominates. In the disease under review it seems clear that bacteria are subordinate, changes in the salivary secretion are so insignificant as to be of doubtful consequence, and it remains to determine how far the nervous system is a causative agent in the curious phenomena by which it is attended. In this direction a comparison of the effect of passing across the skin of the cheek or forehead probes made of different metals—silver, nickel, copper, aluminum, gold—would be of interest (Cohen). Moreover, careful investigation might disclose various signs which are supposed to indicate functional disturbance of the sympathetic nerves.

References.

Arrowsmith, H., The Laryngoscope, July, 1909, 544.
Blegvad, N. Rh., Arch. f. Laryngol. u. Rhinol., 20, 197; translated in Annals of Otol., Rhin. and Laryng., Sept., 1908.
Callian, Jour. de méd. int., 1908, XII., 263.
Cohen, S. Solis, Trans. Path Soc., Phila., 1885-1887, XIII., 70.
Craig, R. H., The Laryngoscope, Jan., 1909.
Delefosse and Sahlé, Jour. de sc. méd. de Lille, 1908, II., 593.
Gaston and Loislet, Bull. Soc. Franc. de Dermat., 1909, XX., 141.
Giraudeau, Thèse de Paris, 1907-8.

Goodale, J. L., Annals of Otol., Rhinol. & Laryngol., Feb., 1900.
Guéguen, F., Arch de Parasit., 1908-9, XII., 337.
Haenisch, H., Arch. f. Laryng. u. Rhinol., 20, 480.
Johnston, R. H., The Laryngoscope, April, 1908, 286.
Landouzy, Union méd. du Nord-Est, 1845.
Leviseur, F. J., N. Y. Med. Jour., Jan. 12, 1889.
Onodi & Entz, Arch. f. Laryng. u. Rhinol., 16, 265.
Perrin & Blum, Centralbl. f. Lar. u. Rhin., 22, No. 2, 1906.
Reinecke, Arch. f. Klin. Med., 70, 1901.
Siebenmann, Arch. f. Laryngol. u. Rhinol., 20, 101.
Stoker, George, Trans. Path. Soc., London, 1883-4, 157. Brit. Med. Journ., 1884, 601.
Urbantschitsch, E., Oest.-Ung. Vrtlj. f. Zahnheilk, 1908, XXIV., 639.
Wingrave, Wyatt (Abercrombie's case), Jour. of Laryng., etc.

A CASE OF LARYNGEAL SYPHILIS.

With a Description of the Difficulties of Differential Diagnosis.

BY HARMON SMITH, M.D.

L. W. S., male, 25 years old when first seen by Dr. John Woodman, of New York City. At this visit, Oct. 29, 1901, the patient had an initial syphilitic lesion for which he was treated.

In January, 1902, mercury was administered in full doses internally and externally. In July, 1902, mixed treatment was instituted. From this time on for three years anti-syphilitic treatment was faithfully given.

Six years after the initial lesion, in February, 1908, the patient had an attack of laryngitis, accompanied with hoarseness and redness of the right vocal cord, which disappeared under treatment given by Dr. Woodman. In April, 1908, an abscess developed in the right cheek, which was supposed to be due to a bad tooth, but which persisted for a long while and finally yielded to mixed treatment. In May, 1908, the right vocal cord appeared thickened and abnormally red, while the adjacent tissues were inflamed. On May 28, 1908, the patient was sent to me by Dr. Woodman with the history just related.

Examination:—He was extremely thin and angular, with a large projecting larynx. His voice was strong and husky. Examination showed no anaemia of the mucosa of the pharynx or larynx. The right vocal cord had a small soft polypoid looking mass about its centre, which seemed to project from the ventricle upon the cord. There was slightly retarded movement, and the tissues were hyperaemic and swollen. I diagnosed the condition as laryngeal syphilis, and advised mixed treatment to be continued and increased daily in quantity.

I saw him again one month later, at which time there appeared to be slight improvement. The patient then disappeared for one

year from my observation, but Dr. Woodman has given me these additional notes:

In February, 1909, eight months after I had seen him last, the patient consulted another throat specialist, who diagnosed the condition as laryngeal syphilis, but advised that he substitute iron for the mixed treatment he was then taking. This was tried for one month, and as the condition did not improve, he consulted still another throat specialist, who promptly said he did not know what it was.

On June 8, 1909, the patient came again to my office, and the examination of the larynx showed an entirely different picture. A globular swelling projected into the larynx from the right ventricle which obscured in a measure a view of the right cord. The cord itself was reddened and thickened, and there appeared to be some projection into the larynx just below the cord. There was slight limitation of movement of the cord in phonation, which increased perceptibly, but not markedly, for several months.

The diagnosis now seemed to lie between syphilis, tuberculosis and a malignant neoplasm. The voice was still very strong, but very hoarse. Slight pain was experienced on swallowing at times. The patient had lost some weight, and was quite emaciated in appearance, although he assured me he felt strong. I had Dr. Jonathan Wright see him at this time, and his remarks will be given later. I felt moderately certain that the case was specific, although mercury and potassium iodide had been so thoroughly administered for so long a period.

Potassium iodide was given again in the essence of pepsin, beginning with 60 grs. t. i. d. and increasing the daily dose until iodism appeared. The pepsin and water was later changed to a glass of milk as a vehicle for the iodides. The iodides were increased to 120 grs. t. i. d. when digestive disturbances prevented further increase.

Morning, afternoon and evening temperature was taken, with a result that over a period of 18 days the morning temperature varied from 98 3-5 to 100 2-5 F., the noon from 98 3-5 to 99 3-5, and the evening from 98 4-5 to 101 4-5 F. Physical examination of the lungs was negative, and the examination of six specimens of sputa was also negative. There was slight glandular involvement just below the larynx.

Mercury was given by inunction. Iron, phosphorus and arsenic were also given internally. The tumor seemed to increase slowly during the month of June, but there was no appearance of any projection that would justify an attempt at obtaining a specimen for examination. The tumor seemed to lie well beneath the mucous membrane, and any attempt to get a specimen would have necessitated cutting deeply into the tissues.

At the end of June the advisability of approaching the tumor extra-laryngeally was considered, but before doing so I sent the patient to a well known throat specialist who has had considerable experience in tuberculous laryngitis, and he diagnosed the condition as tuberculous, or at least a tuberculoma. This made me hesitate to operate.

In July the patient had a small hemorrhage following a coughing spell, which seemed to confirm the diagnosis of tuberculosis, but upon examination of the larynx I found a small ulcerative spot on the apex of the tumor, from which it appeared the blood might have come. From this time the swelling seemed to gradually subside, and in August the patient was advised to go to the Adirondacks for a month. This change seemed to benefit him very much, and on his return there was marked diminution of the swelling. This improvement continued until the ventricle became a deep depression where the prominence of the tumor had previously attained its maximum.

There is still restricted movement of that side and the mucous membrane of the ventricle seems to be retracted by some adhesive force, as from a cicatrix. The cord is slightly hyperaemic, and when first observed upon examination will appear red and dry, but upon continued phonation incident to examination it becomes moist, oedematous and less red. The hoarseness has nearly all disappeared. The patient has gained in weight, and when observed in February last seemed to have nothing more the matter with the larnyx than the expected sequellae of a gumma.

Dr. Wright has kindly given me his observations upon the case, which are as follows:

"In the case of Mr. Smith, which I had the opportunity of studying with you, it seemed to me at the time we first saw him

that the diagnosis lay between syphilis, tuberculosis and a neoplastic growth of the laryngeal ventricle, probably, if malignant, an adeno-carcinoma. The diagnosis could only be arrived at by a method of exclusion, with the tacit understanding that syphilis can never be excluded in such cases, but the other affections sometimes can be. We were embarrassed, as is always the case in affections of the laryngeal ventricles by the impossibility of removing any tissue for microscopic diagnosis. As I remember it, the case came to you from another doctor who had given mixed treatment without avail. A globular swelling projected into the larynx from the region of the right ventricle, and the right cord was markedly reddened, with limitation of movement to only a slight degree.

"In the absence of constitutional symptoms other than some loss of flesh and some afternoon temperature, not of a tuberculous character, it seemed fair to exclude the usual forms of laryngeal tubercle, but it was impossible to say the man did not have that rare form of it described clinically as tuberculoma.

"It also seemed unlikely, and this became an increasingly strong assumption in the course of our observation, that even the slow-growing adeno-carcinoma, the form usual in the laryngeal ventricles, would progress more rapidly than this swelling gave an indication of having done since his history first began. His age was decidedly against the supposition of this form of laryngeal cancer, as indeed it is unusual in any form at his age.

"The supposition that it was a syphilitic lesion, originally gummatous, seemed irreconcilable with the vigorous and various forms of administration of anti-syphilitic treatment which resulted in no diminution of the growth. Assuming, however, that we might have a gummatous inflammatory condition which had resulted in a superficial necrosis of the thyroid cartilage, probably accompanied by a calcareous condition of the sphacelus which was acting as a foreign body, the clinical course seemed much less inexplicable than with any other conception. Had we not this idea in our minds, the haemoptysis which occurred would have confirmed us in the diagnosis of tuberculosis, perhaps, in spite of the fact that examination of the larynx, immediately subsequent to that event, showed a marked retrocession and retrac-

tion in the region of the former swelling, uncovering and making the cord on that side broader. An interesting and confusing phenomena in the course of our study of the case was the remarkable variation in the state of the vocal cord, which still persists, I think. I am of the opinion that the process in the ventricle and its subsequent tissue change interfered with the vascular and lymphatic supply of the cord in a way that we easily imagine to account for it."

With a definite history of syphilis any largyngeal involvement accompanied with some of the symptoms of syphilis is ordinarily diagnosed as specific. But when anti-syphilitic treatment has been persisted in for a year and the lesion has not been influenced thereby, but, on the contrary, has assumed more alarming conditions, then the previous history of syphilis materially complicates the diagnosis. In this particular case the previous history, the unusual redness of the mucosa and the manner of invasion seemed to indicate syphilitic involvement. When observed later, and there appeared a globular mass projecting from the ventricle, marked emaciation, a morning and evening cough, an evening temperature, though not typical; night sweats, pain on swallowing, and slight haemoptysis, there seemed no doubt that the lesion was tuberculous. But the examination of the chest and of six specimens of sputa resulted negatively, so that tuberculosis seemed reasonably excluded. The continued growth of the tumor, the slight paralysis of the cord, the pain on swallowing, the moderate glandular involvement and the location seemed to favor a malignant neoplasm of the ventricle, but the slow growth of the tumor and the age of the patient both argued against malignancy. Every possible means of diagnosis was employed except the removal of a piece for examination, which procedure would have necessitated cutting deeply beneath the mucosa to obtain a satisfactory specimen. I should not have hesitated to have operated externally and attempted to remove the growth without entering the lumen of the larynx, had there not seemed strong probability that the growth was a tuberculoma, or a gumma, an operation for either of which was, in my opinion, contra-indicated. When the hemorrhage occurred Dr. Wright felt strongly convinced that the growth was syphilitic and that the

offending cartilage had probably been expelled, which opinion was clearly substantiated by subsequent events.

Up to this time there had been no evidence of an external destructive process, although it is usual to find some break in the continuity when the syphilitic lesion has existed for a long period. The peculiar anatomical arrangement of the mucosa of the laryngeal ventricles in folds admits the extension of a large growth into the larynx, either specific or malignant, without giving more evidence than a globular projection with an even unbroken surface, with more or less tension of the mucous membrane.

This condition being present without any ulceration lessened our belief in its being specific. After the assumed expulsion of the offending cartilage there was marked retraction of the ventricle, which permitted more of the cord upon the affected side to become visible than could be seen of the one opposite. This was probably the result of fibrous contraction following a destruction of tissue.

Although all of the true cord could be seen with the mirror, it would undergo queer physical change even while examining it. Upon first looking at it, an almost normal appearance was noted, but upon phonation it would become puffy—less red and apparently mucous soaked. This condition has been explained by Dr. Wright as a disturbance, probably, of the vascular and lymphatic supply of the cord. This condition still existed when the patient was last seen.

OBSERVATIONS ON THE VARIETY OF GERMS PRESENT IN WOUNDS FOLLOWING OPERATIONS ON THE FAUCIAL TONSILS.

BY ALEXANDER W. MAC COY, M.D.

In order to see at first hand if there were any predominating organisms in the pseudo-membranes which form over the exposed surfaces after tonsillotomies and tonsillectomies cultures and smears were made from these membranes in twenty cases operated upon in the last few weeks. These cases were operated upon in groups of from three to six. Many of them had been associated in the same ward for two or three days before operation. The others were brought to the hospital the morning of the day that they were to be operated upon. They were kept in the hospital on an average of about five days. The cultures were taken by drying the area to be cultured with a sterile cotton swab, then quickly applying a second sterile cotton swab, turned it once or twice, and pushing up part of the pseudo-membrane; this was cultured on Loeffler's blood serum media and incubated twenty-four hours. Smears were immediately made from this same swab. In a number of the cases cultures and smears were made from both sides of the pharynx. Five of the cases were cultured on the first day after operation, nine on the second day, four on the third day, and two on the fourth day. The smears all showed the usual polymorphonuclear and epithelial cells. The bacteria were numerous and very variable. In all the smears there were cocci. In two spiroehetes and long thin fusiform bacteria were seen, and in two irregular bacteria with beadings resembling polar bodies were present. There were in most all a number of the varied forms of mouth bacteria, not in such numbers as to have any definite significance. The cultures showed nothing significant between those taken early and those taken on the third and fourth days, and there was nothing definite between those from the children that had played

together for a few days previous to operation and those who were not in a ward together until after operation. Two of the cultures were mostly streptococci. Nine were mostly streptococci and staphylococci. One showed the predominating organism to be a short, stout spore-bearing bacillus. In another the predominating organism was a short, stout, unidentified bacillus singly and in pairs. In nine of the cultures there was no predominating organism, but colonies of cocci and bacilli common in the mouth. In four of these, however, a large diplococcus was found and in two, irregular beaded bacilli. In one culture there were proteolytic colonies which digested the blood serum. In none of the cultures were Klebs Loeffler bacilli found. From the cultures of these twenty cases we conclude that there is no predominating organism in the pseudo-membranes, that the ordinary mouth bacteria are to be found in all of them in variable quantities, the cocci being most numerous, and that the cultures will more often show staphylococci and streptococci, probably due, in part at least, to their greater hardiness on artificial media.

The clinical fact always present of membranous exudate covering raw surfaces after tonsillectomies led me to have my interne, Dr. E. L. Crispin, at the Pennsylvania Hospital, make these studies for me. There appears to be no literature on the subject, at least we could find none. This study may interest others in further observations. In my judgment, some unknown quantities are yet to be determined. Perhaps new organisms may be discovered. I submit analyses of the cases as a preliminary report on this subject.

REPORT OF THREE CASES OF LYMPHO-SARCOMA OF THE NASO-PHARYNX AND TONSILS.

With Results of Operative and Medicinal Treatment.

BY CLEMENT F. THEISEN, M.D.

During the past Winter the writer was fortunate enough to have five cases of lympho-sarcoma of the tonsils and naso-pharynx under observation. Of these five cases the naso-pharynx was involved in only one. In this case the left tonsil and glands in the left side of the neck became involved later. This is the only case which has thus far terminated fatally.

In one of the other cases the left tonsil, lower part of the pharynx and larynx were involved, although in this case, too, the laryngeal involvement came on after the primary disease of the tonsil.

In the other three cases the disease was limited to one tonsil. Three of the cases will be briefly reported.

The first case is that of a boy, J. K., aged fourteen years, who consulted the writer during the past Winter for an inability to breathe through the nose.

The boy was thin, poorly nourished, and very anemic. The difficulty in breathing had existed for several months. On examination a large mass, filling the naso-pharynx, and extending into the left nostril, posteriorly, was found. With cocaine a large piece was removed and sent to the Bender Laboratory for examination. Dr. Ordway reported that it was a lympho-sarcoma. The pharynx at this time was clear, but there was some involvment of the glands in the left side of the neck. A short time after this the boy was sent to St. Peter's Hospital, and under ether the growth in the posterior nares and naso-pharynx was removed. There was a profuse but not serious hemorrhage, and the boy made a good recovery, and was out of the hospital within a week. Pieces of the removed growth

were again sent to the laboratory, and a similar diagnosis, lympho-sarcoma, was made.

The patient was put on arsenic, which was given to the point of tolerance, and for a long time got along very well. The growth in the naso-pharynx did not return, but a growth of the left tonsil, as well as a rapidly growing mass in the neck, developed, and the boy died about three weeks ago.

Coley's serum was not used in this case nor in any of the others, because the writer's experience with this serum in cases of sarcoma of the pharynx has been unfavorable.

There is no doubt, perhaps, that this boy might have lived longer if the growth in the naso-pharynx had not been disturbed, because after the operation the rapidly growing metastasis in the neck came on, but the operation made him much more comfortable in relieving the great difficulty in breathing.

The next case is rather more cheerful. The patient, a man aged forty-eight years, was under my care in St. Peter's Hospital during the past Winter. He had been having pain and difficulty in swallowing for several months before coming to the hospital, and had lost weight.

On examination we found a large nodular growth of the left tonsil, filling the entire pharynx on that side. It was firm to the touch. A large piece was removed and sent to the laboratory, and Dr. Ordway reported that this, too, was a typical lympho-sarcoma. It appeared to be a favorable case for operation because no involvment of the glands of the neck could be detected. His larynx at this time, six months ago, was free of growths. The patient seemed to be indifferent to pain, so an operation under cocaine was decided upon. After the usual preparation with cocaine and adrenalin, the growth was grasped with a forceps, pulled well forward and the mass, including the tonsil, dissected out. The bleeding, which was not at all excessive, could be readily controlled by pressure with firm cotton tampons, soaked in peroxide of hydrogen. There was very little bleeding after the operation and this was checked with ice. The patient was discharged from the hospital in three weeks with the wound healed. In six weeks he returned looking fairly well, but with a good deal of dyspnoea. On examination

the scar looked perfectly well, but the larynx contained a large mass similar in appearance to the one removed from the pharynx.

He was again admitted to the hospital, and as the dyspnoea became more urgent a tracheotomy tube was inserted, a solution of equal parts of a ¼ per cent cocaine and 1-10,000 adrenalin being used for this operation. In the writer's experience this works well for tracheotomy in adults.

The patient had been taking full doses of arsenic right along, and this certainly seemed to help him very much. It is now several months since the insertion of the tracheal cannula, and the patient's general condition is very good. There has been no return of the growth in the region of the tonsil, and the cicatrix is normal in appearance. The growth in the larynx is not increasing in size. Whether this is due to putting the larynx completely at rest or to the use of arsenic cannot, of course, be positively determined.

As before mentioned, Coley's serum was not used in any of the writer's cases, because his own experience with the serum has been entirely unfavorable.

In a search of the literature, no case could be found in which the serum *permanently* cured a case of sarcoma of the throat. A case is reported by Emerson (Laryngoscope, March, 1907), in an adult, in which the use of the serum resulted in a "practical" disappearance of the growth, but there was a recurrence and death after seventeen months, and another by W. B. Johnson (N. Y. Med. Record, 1894), a sarcoma of the palate, in which after nine months' treatment with mixed toxins the growth "nearly" disappeared.

In the third case, a young man, aged thirty-two years, the sarcoma was apparently confined to the right tonsil, with no involvement of the glands of the neck that could be detected. The nose, naso-pharynx and larynx were normal in appearance.

A laboratory diagnosis of lympho-sarcoma was made by Dr. Ordway. Operation was performed under cocaine anesthesia. The mass was pulled well forward with a tonsil forceps, and, together with the tonsil, dissected out. The hemorrhage was not

at all severe, and could be easily controlled by pressure with firm cotton tampons and adrenalin.

The wound healed well, and at the present time the patient is in good condition. It is too soon to tell what the result will be, because the operation was performed only two months ago.

Full doses of arsenic, internally, apparently had a very good effect.

No attempt has been made to cover the literature on this subject. Dr. G. B. Wood (Pa. Med. Journal, March, 1909), in his paper "Malignant Tumors of the Tonsil," reports two cases of sarcoma of the tonsil upon which he operated. He gives a table of the published cases of sarcoma of the tonsils, and covers the literature of malignant tumors of the tonsils from 1884.

OZENA AND RESPIRATORY GYMNASTICS.

BY MARCEL NATIER, M.D.

During the last dozen years my attention has been especially drawn to the various troubles of respiration and to their consequences, often unsuspected, which may result from the re-establishment of this function by methodic exercises of respiratory gymnastics. I have without any preconceived ideas carefully watched my patients; I have with a scrupulous exactitude recorded the modifications determined by the treatment to which I submitted them. I have frequently been surprised at my findings. At first they appeared strange to me, but upon reflection I did not fail to perceive that they arose from general laws capable of being explained clearly and with facility; whence our real interest in widening incessantly the circle of our theoretical knowledge and the grave inconvenience there may be in voluntarily abutting ourselves within too narrow limits.

Among the peculiarities which for a long time have impressed me is the favorable action of respiratory gymnastics upon ozena. Is this distressing affection, so hopeless on account of its tenacity and so rebellious to all forms of treatment, truly susceptible of being influenced by respiratory exercises? Let us study the facts. It is better to sit quietly in deep judgment on this point. The only variety considered in this paper will be "essential ozena," thus qualified in order to distinguish it from symptomatic ozena. The following case appears to me worthy of detailed record:

History. A boy of eight years was brought to me for the first time on November 17th, 1905.

Family History. Father fifty years old, nervous and under average height; mother thirty-one years of age, nervous; excellent health at the time of conception of the child; no affection of the nasal passages in either parent. Previous history: born at full term in good condition; weight at birth, 4 kilog. He was sent at his third year to the country with his nurse and has

always been carefully nurtured; bottle fed on plain milk and always from the same source.

At the sixth month, after a development up to that time in every way normal, he had a dangerous attack of dysentery, the acute stage lasting a week. Nothing could be retained on the stomach, a teaspoonful of milk with vichy being expelled as soon as taken. At the end of eight days the diarrhoea ceased on nourishment with sterilized milk; profound emaciation, but of short duration. At the first year he had an abscess of the right ear. Toward the second year, at the time of being weaned from the bottle, his general condition was excellent. He was brought back to his mother at the end of the fifth year at the seashore where the climate agreed with him admirably. A mild attack of measles occurred in the sixth year. There was nothing abnormal about the head, sleep was always very disturbed with dreams and nightmare; no insomnia; slept often with his mouth open; appetite was good and regular; ate too rapidly.

So far as nutrition was concerned, there was almost always a tendency to constipation and sometimes gastric irritation. A liquid diet was prescribed for twenty-four hours. The constipation did not occur except at long intervals. Frequently and for periods of from two to three months the child took nothing but milk from the cup and then after repeated attacks of indigestion which put him in bed and were terminated by vomiting.

Returned to his mother permanently; she showed him to a physician who found his stomach out of order; prescribed a liquid and powder, continued for two months, after which the gastric irritability disappeared without further medication.

On the side of the respiratory apparatus there was no coryza and no sore throat, but in the country frequent though never severe colds. Since his third year he had had some six attacks of nosebleed, coming on during the night except on one occasion, a year previous, when it occurred in the daytime and was very abundant. It was checked by aspirations of vaseline into the nares and was attributed by the physician to "poverty of the blood."

Ozena. At the third year the existence of the ozena was determined. Large crusts were expelled with light bloody

oozing. The odor was progressively lessened, but each day the child soiled not less than three or four handkerchiefs. The affection then remained stationary, but has become seriously aggravated in the last four months. The crusts have become more abundant, the bad odor has at times increased in frequency and intensity, appearing for about fifteen days every two or three months. He has become a source of anxiety to his parents.

Voice: hoarse quite often for the last six months on waking in the morning; clears during the day, but always a little thick. Cough quite common on waking for the last year; respiration quiet at the apices, slow pulse. From the eighteenth month to the seventh year there have been frequent attacks of urticaria, lasting on the average about eight days. This year, while at the seashore, a new eruption appeared for three days. With the idea of checking these skin disturbances the child took only beer as a drink. For four years he had taken cod liver oil during the winter. Moreover, for eighteen months he had taken hydrotherapy daily except during the winter.

Except during the last two months no care has been taken of the nose. This and the open mouth have led to a suspicion on the mother's part of the presence of adenoids. A specialist found none and made a diagnosis of ozena only, and that incurable. For lessening the disagreeable effects he prescribed a pomade and boric acid insufflations and made suggestions of the restoration of the turbinates by paraffin injections. After two months of treatment the secretion had increased in amount and the odor had become more penetrating and stronger.

On November 20th, 1905, he was found to be below average stature, facies was bright, eyes lively and general expression rosy and animated. The nose showed only an enlargement at the base. The nasal fossae were covered especially on the right side with dry and mal-odorous crusts. After cleansing it was possible to detect a distinct discoloration of the pituitary membrane with advanced atrophy of the inferior turbinates, especially the right. On the same side the middle turbinate was a little enlarged and covered with a lightly granular mucosa. The septum was deviated to the left, the posterior wall of the pharynx

was clearly visible through the anterior orifice of the right nasal fossa.

The mucosa of the posterior pharyngeal wall was thickened and covered with dry secretions. There was a paresis of the true vocal cords. They were reddened and covered with a shining layer of mucous secretion, rounded, deformed, their free borders being concave, touching only in phonation. Without considering the face, the child appeared to be in a flourishing condition. This opinion was immediately modified when the child was stripped for examination. The excursion of the respiratory movements, very much reduced in general, was absent at the apices. The skin was yellow, dry and coarse to the touch. The photographs here presented give a clear idea of the different aspects of the body. Looked at from the front, the chest showed a certain sinking in from top to bottom, especially evident at the level of the mamillary line. In profile there was a light arching of the cervical and superior dorsal regions with an angular projection of the shoulder blades. The back was more pronounced in this respect, with a saddle-shaped appearance of the dorso-lumbar region. The limbs were moderately slender.

Treatment. The child was placed exclusively on respiratory gymnastics. No local therapy was allowed; the use of the pomade was stopped until at the beginning of cure. The efficiency of this latter is strongly evidenced by a comparison of the photographs. They show clearly the objective modifications obtained.

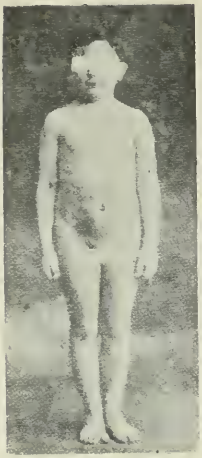


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

These different photographs represent the condition of the child before (1, 2, 3) and after (4, 5, 6) treatment by respiratory gymnastics.

Not less convincing is the reading of the figures in the following table:

*A.—Increase in Weight.**

17	November,	1905	23 k. 840	17	January,	1906	26 k. 050
18	"	"	24 " 080	18	"	"	26 " 380
20	"	"	24 " 260	19	"	"	26 " 620
21	"	"	24 " 180	20	"	"	26 " 590
22	"	"	24 " 360	22	"	"	26 " 500
23	"	"	24 " 260	23	"	"	26 " 910
24	"	"	24 " 210	25	"	"	27 " 130
25	"	"	24 " 230	26	"	"	27 " 030
27	"	"	24 " 260	27	"	"	27 " 050
28	"	"	24 " 070	29	"	"	26 " 950
29	"	"	24 " 590	31	"	"	27 " 230
30	"	"	24 " 780	1	February,	"	27 " 410
1	December,	"	24 " 560	2	"	"	27 " 130
2	"	"	24 " 540	5	"	"	27 " 340
4	"	"	24 " 920	6	"	"	27 " 420
5	"	"	24 " 750	7	"	"	27 " 360
6	"	"	24 " 830	8	"	"	27 " 500
8	"	"	24 " 790	12	"	"	27 " 840
9	"	"	24 " 980	14	"	"	27 " 700
11	"	"	25 " 040	15	"	"	27 " 770
12	"	"	25 " 050	16	"	"	27 " 940
13	"	"	25 " 110	17	"	"	28 " 090
14	"	"	25 " 500	19	"	"	28 " 270
15	"	"	25 " 080	20	"	"	28 " 070
16	"	"	25 " 260	22	"	"	28 " 180
19	"	"	25 " 120	24	"	"	28 " 430
20	"	"	25 " 300	26	"	"	28 " 470
21	"	"	25 " 150	27	"	"	28 " 560
22	"	"	25 " 230	28	"	"	28 " 750
23	"	"	25 " 220	2	March,	"	28 " 730
26	"	"	25 " 240	3	"	"	28 " 760
27	"	"	25 " 500	5	"	"	28 " 460
28	"	"	25 " 580	6	"	"	28 " 830
29	"	"	25 " 620	8	"	"	29 "
30	"	"	25 " 950	10	"	"	28 " 740
2	January,	1906	25 " 980	12	"	"	28 " 810
3	"	"	26 " 130	13	"	"	29 " 040
4	"	"	26 " 170	15	"	"	28 " 890
5	"	"	26 " 580	16	"	"	29 " 220
8	"	"	26 " 080	17	"	"	29 " 150
9	"	"	26 " 260	20	"	"	29 " 250
10	"	"	26 " 350	21	"	"	29 " 190
11	"	"	25 " 790	22	"	"	28 " 900
12	"	"	25 " 720	26	"	"	29 " 050
13	"	"	25 " 970	26	April,	"	28 " 600
15	"	"	26 " 240	21	May,	"	26 " 720
16	"	"	26 " 360				

*The patient was always weighed with his clothing on.

B.—Increase of Chest Perimeter.

	A.	M.	D.
17 November, 1905	56-58	56-57	56-57
4 December, 1905	58-61	58-62	57-61
22 December, 1905	59-62	58-63	58-62
5 January, 1906	60-64	59-63	59-63
6 February, 1906	62-65	62-66	60-64
26 March, 1906	64-68	64-68	62-66

The measurements were taken at the levels of, respectively, the axillary (A.), the mamillary (M.), and the diaphragmatic (D.) lines; hence the three groups of figures. In each column the figure indicates, first, the measurement of the chest in repose, and, second, the development to which the chest expands in forced inspiration.

The gains realized are thus summarized: Weight, increase, 5 kil. .210, a daily average of about 45 grammes. Chest circumference, increase, 8 cent. in repose and 10 cent. in deep inspiration (A.); 8 cent. in repose and 11 cent. in deep inspiration (M).; 6 cent. in repose and 9 cent. in deep inspiration (D.). Height, increase, O. m. .021MM., and three months later, an increase of O. m. .025; in about seven months, O. m. .046MM.

If we compare these figures with those furnished by a child of like age we at once show that at the beginning the inferiority in weight of our patient was about 2 kil. and in height at least O. m. .04 ccm. At the end of treatment it was, on the contrary, an advance of 4 kil. and his height had become normal.

March 26, 1906.—Passed from under treatment; condition as follows: Nasal fossae, left, no trace of mucous discharge; right, small, dry and thick crust on the upper part of the inferior turbinate; normal color of the mucosa on both sides; inferior turbinates slightly increased in volume. Pharynx, mucosa normal, no discharge. Larynx, vocal cords normal; they approximate exactly. Skin, white, supple and soft to the touch.

The mother has noted that he blows out crusts exceptionally now; instead of using, as before, three or four handkerchiefs each day, he has, in the last four months, used two in one day on only thirty-eight occasions. During this period there has been twenty-seven times a fugitive odor.

He has been obliged to put on larger clothing three times dur-

ing this period. The child now passes excellent nights, sleeping eleven hours consecutively and never snoring. There has been no epistaxis and the stomach is all right. He has become less nervous and has a greater capacity for work; in spite of an absence from school of four months his comrades have been overtaken in their studies and he has regained the first place in his class.

Three months after the suspension of his treatment the child was emaciated; the heat had rendered him more nervous; he continued to soil one handkerchief each day, occasionally expelled crust, but exhaled no odor. The mother then informed me that she had, during the last two weeks of treatment, used irrigation of the nose about twice a week.

January 10, 1910.—The general health of the child is always excellent, a fact of which I am convinced, for I have seen him regularly. The ozena, the father tells me, reappeared some time after the definite suspension of the treatment, but has been notably benefitted by practicing nasal irrigations with the addition of iodine. After staying some time at the seashore the odor was much longer in returning, and the intervals of absence have been regularly increased.

It would be useless to return to the details of this case. Each one suggests its own comment. I would simply place in relief the succession of morbid phenomena which seem to me to have been present; first, the ozenatous constitution, and, second, I would try to explain the benefits acquired by the respiratory gymnastic exercises.

Having no desire to pass in review the various theories upon the pathology of ozena, I would derive my argument only from the facts of my personal experience, quite similar to those I have just related, in order to support the thesis I propose to maintain.

Now, what lessons can be deduced from the observation of our little patient? The most important indication is, according to my view, the attack of dysentery at the sixth month. Here is the first link in the pathological chain which continued to form in regular and apparent fashion up to the moment of my intervention. The child had just undergone a profound impression, as happens in all patients who have been subjected to severe

maladies at the commencement of life, and in particular in the course of the first year. To start from this point, the digestive apparatus did not functionate property and regularly, there being frequent auto-intoxications, giving, as a result, various disorders in different parts of the body. The terms I have used could have been amplified. But the fact which should not for a moment be lost sight of is the common origin of the patient's ills and the bond which unites them. With this idea for a guide, embarrassment disappears and the path is illumined with perfect clearness.

A similar conception, if you will admit the phrase, throws a remarkable light upon the etiology of ozena, a subject so much discussed and qualified by the term "essential." It has to do no longer with a morbid entity, perfectly autonomous, engendered in situ, but altogether with one of the local manifestations ordinarily slowly developed upon an older disturbance of the general condition. Thus the pathological framework grows broader, and the satisfactory reason of being able to point out the true, exact sources finds itself disentangled from the false restraint imposed by changing hypotheses, and in reality too narrow. One can now have a suspicion as to the causes of ozena, specify the true features of its beginning, note with precision its phases of aggravation and amelioration and understand their mechanism.

Moreover, a certain knowledge of the cause conduces naturally to a more logical understanding of the therapy. This should not be a uniform one, but ought to adapt itself to the actual condition, and will vary according to the age of the lesion and the time at which we are called on to combat it. If we find ourselves in the presence of an ozena of comparative recent date, it must suffice, the cause being discovered, to act upon the causal malady, perhaps at a site far removed, in order to suppress the causal effect. In this case local treatment is useless; "sublata causa, tollitur effectus." In proof of this assertion I will mention a child of four years, in whom I endeavored some months ago to arrest an ozena at its beginning by treating with proper care the gastro-intestinal troubles with which it was affected.

At other times matters arrange themselves. Thus, a patient affected for a long time with ozena will have tried in vain various

remedies, and then will see it suddenly cease. Has a true spontaneous cure been effected? No. Looking at the case more closely it will be noted that there has been produced a profound modification of the lesion. This may be, perhaps, a speedy matter especially following severe sickness. These transformations, on the other hand, operate at times much more slowly. The result is a constant restoration of the equilibrium of the organism. A good example of this has been told me by one of my patients. Her sister was much emaciated, had grown very rapidly, and had become very much tired out. Toward the age of sixteen, and perhaps earlier, she began to present evidence of ozena. Two years later she left the country, where she had always lived, and came to live in Paris. She was placed in apprenticeship to a dressmaker, who overworked her and failed to give her the proper nourishment. Consequently, after two years of real suffering she fell into a condition of profound and persistent anemia. At the beginning of this year she exhaled a horribly fetid odor, blew out very large crusts and complained continually of violent pains in the head. Toward the eighteenth year she sought assistance, and was advised to employ nasal irrigation, which she practiced irregularly for six months with some benefit. At the twentieth year she changed her place of living, was better treated, and at the end of two years the anemia definitely ceased. In the course of this long period the menses never ceased, but they always were excessively scanty, lasting not more than two days. Now, as the anemia diminished the ozena notably improved, and toward the twenty-fifth year the emaciation gave way to an embonpoint, the ozena disappeared and never returned.

In current practice a like result is far from common. Insufficiently enlightened as to the gravity of the disease, at first the parents, and later the patients themselves, neglect to take the precautions necessary to ward off the disastrous consequences. Thus often occurs at length irreparable damage. As to the rest, there is, I repeat, no fixed time as to the appearance of the symptoms. All depends on the nature of the original affection and the rapidity of its development. Atrophy, the ultimate stage of evolutionary processes, affects at the time the mucous covering and the subjacent bony skeleton. This demonstrates well the

nature of the lesion, and its continuance manifests a profound nutritive trouble. It is evident that there will be reached in these cases a period in which we are limited to symptomatic treatment. Then there comes into play a series of pallative measures, upon the value of which opinions are far from being harmonious. However, and even after a long duration, ozena can still be advantageously combated by an etiologic therapy, directed with method and discernement. I have carefully followed this line with different patients among my clientele. The success obtained has fully verified the justice of my theories, and for the support of this statement I feel that I can properly invoke as evidence the history of my patient. The benefits which have been derived from the practice of respiratory gymnastics are undeniable, and the progress in the lessening of the ozena has been, in the course of the treatment, proportionable to the improvement of the general condition. If the cure has not been complete it is because the intervention has been too late, and I have not been able to check a process the evolution of which has been already accomplished. Sometimes I have been conscious of having improved the soil, and of thus having opposed successfully a later and more profound retrograde process. The actual progress of the affection has not prevented optimistic hopes for the future.

How shall we explain the happy effects of respiratory gymnastics in these cases? Very simply, and thanks in particular to the action on the nervous and circulatory systems. Hematosis is effected in more normal conditions, the quality of the blood is improved, and the functions of the nervous system and of the circulation are carried on with more perfect regularity.

An essential point on which we cannot dwell with too great insistence is the fact that the different glandular secretions are rendered more active and regular. Thus nutrition recovers itself and the equilibrium of the system is re-established.

In conclusion, we ought always, by an exhaustive inquiry, to go back to some grave affection of the general system for the origin of that form of ozena we have considered in this study. This form appears especially and almost exclusively in the first years of existence—that is, at a time when the organism of the child, following it may be hereditary predisposition, or, as

the result of pathological accidents, may be eminently sensitive to external and internal influences. Thus the formation of the constitution is influenced in different directions.

Thus looked at, the pathogeny of ozena ought logically to lead to a special conception of its treatment. As soon as the first abnormal manifestations show themselves we must intervene to arrest their course, which we can do by prompt intervention directed against the maladies they reveal. For a long time after its commencement we will have opportunity to combat ozena successfully by measures directed alone to the faults of the general system.

Sometimes ozena is cured spontaneously, but it is the exception, and can never be counted on.

Later, at the time of irreparable damage, one can utilize the arsenal of palliative treatment, but remedies are unreliable. The indications for respiratory gymnastics in patients affected with ozena are frequent; their utility is incontestable, because they apply the principles of a sound physiology. Their employment recommends itself.

TRANSPLANTATION OF RIB CARTILAGE INTO THE NOSE IN A CASE OF NASAL DEFORMITY.

BY D. CROSBY GREENE, JR., M.D.

In the correction of deformities of the nose characterized by sinking and flattening of the bridge there is a useful field for the transplantation of cartilage. In the first place it has sufficient rigidity to maintain a given shape and position when once secured in position. It has also an advantage over any form of artificial bridge in being absolutely unirritating, and therefore not in danger of sloughing out, but, on the contrary, becomes actually incorporated in the tissue in the midst of which it is placed. It has, moreover, an advantage over bone in that it may be easily trimmed to a desired shape during operation.

With these considerations in mind I have availed myself of the material always at hand in these days of submucous resection of the septum, and transplanted cartilage from the nose of one individual to that of another. The immediate result in the cases in which this procedure was tried was satisfactory, but, as I have reported in a previous paper[1], the cartilage becomes eventually absorbed and replaced by fibrous issue, so that the end result—although a distinct improvement over the original condition—was not as good as that which was obtained for a few months after operation. The absorption of cartilage which took place in these cases was to have been expected in the light of the experiments of others[2] in transplanting cartilage. These have shown conclusively that cartilage transplanted without its perichondrium becomes always eventually absorbed, while cartilage with its perichondrium attached may be made to grow in a new locality. Inasmuch as the successful performance of the operation of submucous resection of the septum depends on the car-

[1]Boston Medical and Surgical Journal, March 17, 1910.
[2]Marchand, Tizzoni, Ollier, Prudden vid Deutshe Chirurgie, 1901, Lieferung 16, S. 451.

tilage being removed subperichondrially, the material thus obtained is not suitable for transplantation in cases in which it is desired to make a new, definite and permanent nasal bridge.

Von Mangold[3], in 1901, reported cases of transplantation of costal cartilage with its perichondrium into the nose in two patients with nasal deformity, and the success of his operation led to a trial of the method in the case which I now wish to report. The technic employed in his case differed primarily from mine, in that he used an external incision for the introduction of the transplanted cartilage, while in my case the incision was intranasal.

The patient, a young man of twenty-two, was referred to me for deformity of the nose, resulting from a football injury eight

Fig. 1.

Enlargement of an old photograph taken a year before operation.

Fig. 2.

Photograph taken four months after implantation of costal cartilage in the nose.

years before. He had received a blow on the bridge of the nose, which was followed, apparently, by an abscess of the septum. Examination showed a very marked symmetrical flattening of the bridge. The nasal bones had been driven in and the cartilage of the septum was absent, except for a small portion in the lower posterior quadrant. The anterior part of the septum was, therefore, membranous. (Figs. 1 and 2.)

[3]Chirurg. Cong. Verhandlung, 1900, p. 463.

On December 28, 1909, a portion of the cartilage of the right ninth rib was transplanted into the nose as follows: Under ether anesthesia I prepared the chamber for the reception of the cartilage in the nose, at the same time that Dr. F. E. Garland exposed the rib by an oblique incision over the distal ends of the eighth and ninth ribs. The latter was carefully dissected from its attachments of muscles and fascia without injury to the perichondrium. In the meantime a vertical incision was made through the septal mucous membrane of the left nostril, just posterior to the muco-cutaneous junction (see diagram 1). Through this

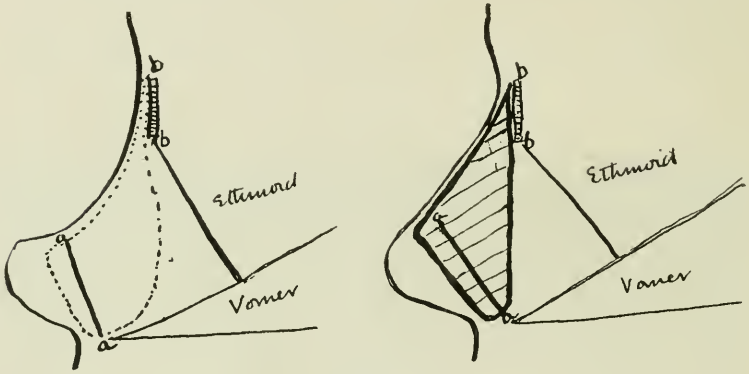


Fig. 3.

Diagram 1.—a-a, line of incision; b-b, nasal bone; dotted line shows area of chamber prepared for reception of cartilage.

Diagram 2—a-a, line of incision; b-b, nasal bone cartilage in position.

incision the two layers of membranous septum were separated by knife dissection anteriorly as well as posteriorly. At its upper and posterior parts the chamber thus formed was enlarged backwards and upwards over the depressed nasal bones by means of a sharp rasp, which elevated the skin and soft tissue from off the nasal bones (Fig. 3). The size and shape of the piece of cartilage to be used were then determined by fitting a piece of sterilized leather into the space prepared. This leather having been trimmed to the proper shape, a portion of costal cartilage about the same size was removed and trimmed with scissors to match it. The shape was, roughly, that of a right-angled triangle, with the longer leg the top and the shorter leg the anterior edge of the

new septum (see diagram 2).. The cartilage having been inserted into its new position, the wound was closed by a single catgut suture, and both nares were lightly packed with gauze. The wound healed by first intention, and there was only moderate swelling of the external nose after operation. The rib wound caused more discomfort than the nose. Owing to the formation of a hematoma in the gap left by the excised rib, which broke down, there was delay in the healing of this wound, but in two weeks this had also healed. The photographs taken before and four months after the operation show the amount of correction obtained. The cartilage can be distinctly felt and shows no tendency to become absorbed.

SYPHILITIC STENOSIS OF THE ORO-PHARYNX.

BY J. M. INGERSOL, M.D.

All of us know how difficult it is to prevent the contraction of syphilitic scar tissue in the nasopharynx or larynx. In the oro-pharynx the difficulties encountered are even greater. Syphilitic adhesions between the walls of the pharynx and the base of the tongue tend to contract concentrically, and gradually shut off the mouth from the oesophagus and larynx, and thus interfere with respiration and deglutition.

The following case of syphilitic stenosis of the oro-pharynx is reported because the contraction of the scar tissue has not yet been successfully prevented, and the author hopes that the Fellows of this Association will suggest some methods by which the difficulties may be overcome.

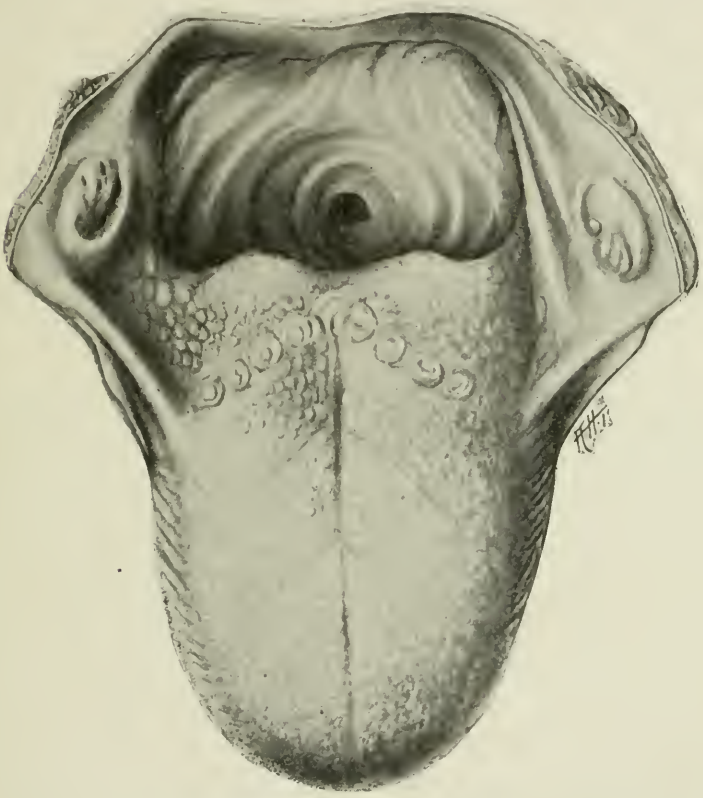
The patient, a man eighteen years old, was seen first in June, 1909. About two years before this date he had had a primary luetic infection.

From the history which he gave it would seem that tertiary lesions had developed in the throat early. The throat had been very sore and he had had increasing dyspnoea and dysphagia. When I first saw him he was having considerable difficulty in swallowing even liquids, which regurgitated through the nose, and solid foods could not be swallowed at all. Except for a small spur the nasal fossae were normal. The nasopharynx was almost completely closed by syphilitic scar tissue uniting the posterior pillars and the soft palate with the pharyngeal wall, leaving an opening about one centimeter in diameter. The uvula had disappeared entirely.

Just below the level of the tongue syphilitic scar tissue could be seen extending across the oro-pharynx, uniting the lateral and posterior walls of the oro-pharynx with the tongue. About in the center of this scar tissue there was an opening one-half centimeter in diameter, through which the inspired air and food

must pass. The opening was so small that it was impossible to secure a view below it. The breathing was labored. He had been losing flesh constantly and was quite weak and emaciated.

A free incision was made from the opening in the scar tissue to the lateral wall of the pharynx on each side under cocaine



Stenosis of the Oro-Pharynx, caused by syphilitic scar tissue uniting the posterior and lateral walls of the pharynx with the base of the tongue. Author's case.

anaesthesia. A good view was then obtained of the larynx. All the structures below the scar tissue seemed to be normal. There was very little hemorrhage and the patient was able to eat with a considerable degree of comfort on the following day. He rapidly gained in flesh, and when he was discharged from the hos-

pital failed to report again for about a month. At that time the scar tissue was beginning to contract again, and another incision was made on each side into the pharyngeal walls. During the night following the operation he had considerable hemorrhage. A few days later he was given a rubber bougie and instructed to pass it into his oro-pharynx several times a day and hold it in position as long as possible. He then left the hospital and failed to report for observation and treatment for five months. During this period he had been fairly comfortable and had neglected to use any sort of bougie, and the scar tissue had again contracted. Incisions were again made through the scar tissue, and he was given two oval metal tubes of different sizes, with careful instructions, so that he might use them and prevent the contraction of the scar tissue.

Unfortunately the patient has failed to carry out the regular dilatation with the tubes, and there is a constant tendency for the original condition to return.

Dr. B. F. Curtis reported a similar case, in which the pharynx was almost completely shut off by scar tissue. At the base of the tongue the scar tissue closed the oro-pharynx except for a small perforation about a quarter of an inch in diameter. In this case a preliminary tracheotomy was done. Then a transverse incision was made on the left side above the hyoid bone, and the pharynx was opened between the epiglottis and the tongue. The scar tissue, forming a web across the oro-pharynx, was then divided. A flap was made from the skin on the left side of the neck, five inches long and two inches broad, and was reflected upward, so that its raw surface was brought in contact with the raw surface in the oro-pharynx and sutured in position. Rectal feeding was carried on for seven days and the flap healed in good position. After the first week the patient was fed by a stomach tube cautiously passed through the mouth. Twenty-four days after the first operation the flap was dissected back from the external edge of the opening into the pharynx and united to the mucous membrane of the pharynx. The edges of the external opening were sutured into position, and the raw surface on the neck was covered with skin grafts.

Rectal feeding was again given for four days. Then the pa-

tient was allowed to swallow soft food by the mouth. Swallowing was difficult at first, but the function of the pharyngeal muscles was soon restored. After the external wound had completely healed the tracheotomy tube was removed. There was very little if any tendency for the scar tissue in the oro-pharynx to contract. The transplanted skin in the pharynx soon assumed the appearance of mucous membrane, and the patient was apparently perfectly cured.

Dr. Curtis also mentions a case reported by Dr. Park, in which it was necessary to do a tracheotomy and gastrostomy, because the patient was too irresponsible to allow systematic treatment by dilatation.

Dr. Vansant reported a case of syphilitic stenosis at the base of the tongue, in which four extensive operations were performed, excising the cicatricial tissue without favorable results, and the patient finally died of inanition, refusing to have a tracheotomy done.

Dr. J. E. H. Nichols read a paper before this Association at its eighteenth annual meeting, describing a method devised by him for severing the syphilitic adhesions between the naso-pharynx and pharynx. He passed a curved needle through the opening in the scar tissue and carried it as far laterally as the radius of the curve would permit, and brought it down through the adhesions, and then tied the ends loosely, so as not to strangulate the enclosed tissue, leaving it in position for a week, during which time the edges of the little canal around the loop became cicatrized, firm tissue. The loop was then cut and withdrawn, and the intervening tissue between the new opening and the original opening was severed with a knife. The narrow band of cicatrized tissue at the end of the incision was enough to prevent union between the free edges of the incision.

Dr. G. A. Leland reported a case in which stenosis of the oro-pharynx was relieved by the method devised by Dr. J. E. H. Nichols. Part of the scar tissue on the right side of the pharynx was included in a suture tied loosely and left in position. The suture was renewed several times, and in about two months' time it had cut through the tissue so that the opening through the scar became large enough to permit the patient to swallow liquid and

semi-solid foods. Several months later the same procedure was adopted on the opposite side, and the opening in this way considerably enlarged. No mention is made of the length of time that the patient was under observation, and hence there is some doubt in regard to the ultimate result.

Dr. C. K. Briddon reported a case in which the incision was made through the scar tissue, and the tendency to contraction was combatted by the patient using a soft rubber bougie twice a day. The case was under observation only two months, however, and the final result is not known.

Dr. W. H. Battle reported a similar case under observation for several months in which there was a constant tendency to contraction.

Dr. Mesny in 1893 collected the report of thirty-four cases of cicatricial stricture at this level and stated that the scar tissue did not tend to contract after an incision has been made through it. This opinion is not upheld by the reports of the cases which have been under observation for six months or more. In fact the chief difficulty in the treatment of such cases is the prevention of the contraction of the scar tissue.

Bibliography

Extreme Stenosis of Lower Part of Pharynx (syphilitic) W. H. Battle, Clinical Society's Transactions, vol. 28, London, 1895.

Severe Pharyngeal Stenosis from Syphilis Relieved by Operation after Tracheotomy. Dr. Chas. K. Briddon, Annals of Surgery, vol. 17, Jan.-June, 1893.

Drei Falle von Strictura Pharyngis Syphilitica Von Professor Edvard Welander zu Stockholm. Archiv für Dermatologie und Syphilis, vol. 61, 1902.

A Case of Extreme Pharyngeal Stenosis, the Result of Syphilis with Remarks. T. Gilbert Smith, M.D., and W. J. Walsham, F.R.C.S., Medico-Chirurgical Transactions, vol. 53.

Cicatricial Stricture of Pharyngeal Orifice, Relieved by Plastic Operation. G. A. Leland, M.D., Boston Medical and Surgical Journ., vol. 151, July-Dec., 1904.

The Sequelae of Syphilis in the Pharynx and Their Treatment. J. E. H. Nichols, M.D., New York Med. Journ., vol. 54.

Cicatricial Stricture of Pharynx Cured by Plastic Operation. B. Farquhar Curtis, M.D., Annals of Surg., vol. 33, Jan.-June, 1901.
Dr. Park, International Med. Magazine, July, 1883, p. 550.
Mesny, Heymann's Handbuch der Laryngologie und Rhinologie, Wein, 1899, 11, p. 446.
Vansant, Med. News, Phila., 1894, 65, p. 606.
Lublinski, Berlin Klin. Wchnschr, 1883, 20, S. 361.
Largreuter Arch. für Klin. Med. 1880, 27, S. 328.
Gerhart, Virchows Arch. für Path. Anat. 21, 40.

Discussion.

Dr. J. H. Bryan: I have had several of these cases, and find them the most troublesome that we have to deal with. I have never had a successful case; every one has had a recurrence of the adhesions, and it seems impossible to give the patients any complete relief from their troubles. I have carried cases along for six or eight months, possibly for a year, and still contraction has taken place and the conditions have been almost as bad as before. I have tried the flap operation—bringing the upper and lower edges together and trying to form a posterior wall to the pharynx, yet there has been contraction, leaving the patient still very uncomfortable.

SUPPLEMENTAL REPORT ON OPERATIONS ON MALIGNANT GROWTHS OF THE UPPER AIR TRACT.

BY J. PRICE-BROWN, M.D.

Dr. Brown made the following verbal report with reference to the cases of Nasal Sarcoma previously reported before the Association:

I desire to make a further report on three later cases of nasal sarcoma that I had the honor of reporting to this Association last year. The first case was one in which I removed three-fourths of the posterior portion of the cartilaginous septum. In this case there has been no return. The other two were young men who lived outside of Toronto, and by my instructions they returned at Christmas time for re-examination. They were feeling perfectly well, but came to report. In each case I found a return of the growth. It had formed in the upper and back part of the nasal passage; in one on the right side, in the other on the left. The parts affected were in each case the middle turbinate and upper portion of the posterior naris, slightly projecting into the naso-pharynx. I pursued the same electro-cautery methods of treatment again. In regard to the method of operation: In each case I applied twenty per cent. sol. cocaine, with 1-2000 adrenalin. In both cases the pain was nil except in the region of the speno-palatine ganglion, and in the younger man I had to increase the strength to forty per cent., when by careful application of the cocaine to the speno-palatine region I proceeded with the operation. The operations themselves produced no pain, or very little; but the patients complained of intense heat in the surrounding parts while the cautery was being used, which may have been the cause of the cure, by coagulating the blood in the vessels and preventing auto-infection. These two cases have progressed. One I have operated on with the cautery I think seven times since Christmas, and the other twice as

often; and I insisted that they should remain under observation. When I reported them last year one weighed 120 and the other 145 pounds; they now report 150 and 180. Both strong, vigorous men; no history of syphilis or tuberculosis, but both active men from the country. I treat them once a month, or twice, if necessary. Formerly I had them come daily, but that is not necessary now. It does not interfere with their work in any way, and there is no hemorrhage after leaving the office. I never pack. It may be asked why I do not take sections again? I think it would be pernicious to do so, as a large segment would have to be removed by knife to obtain a satisfactory examination. They have both improved by constant care and attention. Eventually it is possible that the recurrences will cease from gradual attenuation of the virus. In another case first operated on nine years ago, it is three years since I operated last, and he is perfectly well to-day. These last two are likewise well, so far as appearance and feeling are concerned, but the growths still continue to recur.

AN INSTRUMENT FOR DIRECT INTUBATION OF THE LARYNX.

BY HARRIS P. MOSHER, M.D.

In the Laryngoscope of October, 1909, I published a preliminary account of a case in which direct intubation was employed. The instrument was not described because I wished to test it further. Since the preliminary report the instrument has been used on one case some six times. It has also been successfully tried on one adult. Dr. Clark, one of my superiors at the hospital, has tried it for extracting a tube. The child, a little girl five years old, upon whom I have used the instrument, per-

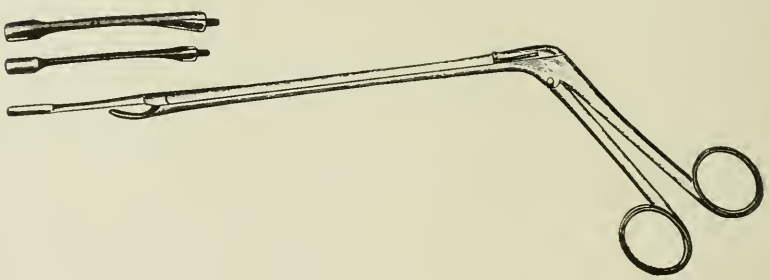


Fig. 1.

Forceps for direct intubation. The forceps is shown with the extractor in place. Above are shown the obturators for the larger tubes.

mitted direct intubation and extubation the last three times without ether. On these occasions the pharynx was anesthetized by ten per cent. cocaine and by the promise of a ten cent reward. The combination worked very nicely. On the adult twenty per cent. cocaine solution was used. These two cases show that the procedure does not necessitate the use of ether.

The instrument is built on the plan of a pair of alligator forceps. In fact a pair of these forceps can be used for the manipulation if nothing else is at hand. My instrument is best

described as a pair of alligator forceps, the lower blade of which is broadened out into the shape of a cup, whereas the upper movable blade is extended into an obturator. (Fig. No. 1.)

The upper blade acts as an obturator for introduction and as an extractor. Three obturators screw into the base of the upper blade, and these three obturators fit all sizes of tubes, from the smallest tube for the infant to the largest adult tube. Each obturator has a joint in the middle which allows the lower half to tilt upward during its withdrawal. (Fig. No. 2.)

Fig. 2.

Cut to show joint in the obturator which allows the obturator to be withdrawn without binding.

The tube is introduced with the patient on the back and with the head over the end of the table. In this position, when the tube is in the larynx it naturally tilts a little upward. Owing to this, I found that unless the obturator had a joint it was liable to bind on the way out. Further I found that in direct intubation under cocaine, often only the posterior half of the larynx is seen. This makes it necessary to point the end of the

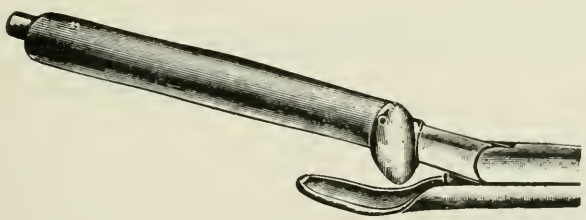


Fig. 3.

Forceps for direct intubation. Cut to show how the tube can be raised in order to facilitate its introduction.

tube slightly upward. This is easily done because the tube can be tilted to any angle by spreading the handles of the forceps. (Fig. No. 3.) Even in direct intubation it is better to thread

the tube as in indirect intubation, for it is perfectly possible, as I can say from one humiliating experience, to intube the esophagus.

It is not necessary to use the three special obturators except in cases in which there is danger of the tube becoming blocked during the introduction. In papilloma of the larynx, such a danger exists, therefore, it is necessary to use them in such cases. It is better, also, to use the special obturators in cases of inflammatory narrowing of the larynx. In the adult whom I intubated, the lesion was of this class. In the child, however, I was dealing with post diphtheritic adhesions between the cords. In this case I found that the extractor, which is simply the smallest obturator without the joint, could be used both to insert the tube and to extract it. Even in such cases, at the first introduction of the tube, which I imagine will generally be done under ether, it is better to use the obturator. After this, the tube has made a channel for itself and the special obturator is no longer required. (Figs. 4, 5.)

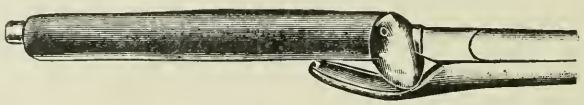


Fig. 4.

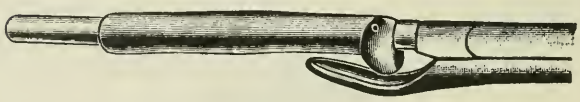


Fig. 5.

Figs. 4-5. Forceps for direct intubation. The cuts show the manner in which the forceps hold the intubation tube. The lower cut shows the tube in the forceps. In order to reduce the number of obturators, with the smaller tubes the obturator is allowed to project beyond the tube.

With small tubes, intubation and extubation can be performed through the Jackson speculum. Extraction can always be done through this instrument, if the tube and speculum are withdrawn together. To this, of course, there is no objection. When, however, large tubes are to be inserted the writer's open speculum

is essential. I am somewhat used to the open speculum and so employ it in all cases. The open specula as they were first gotten out were too large and there were too many of them. I now use but two sizes, a child's size and a size for the adult.

The set for direct intubation consists of the tooth plate, the open speculum and the intubation forceps with three obturators and one extractor.

Discussion.

Dr. J. R. Winslow: In a paper presented before this Society at Boston last year upon the subject of chronic stenosis of the larynx and trachea I recorded a case of chronic stenosis of the larynx treated by intubation by the direct method. The stenosis was probably of syphilitic origin, and was treated by me in 1907. Since then I have treated several cases by this method; during the past year I treated a case of chronic laryngeal stenosis, due to typhoid fever, by direct intubation. The method has many advantages, particularly in cases of chronic stenosis; it is one of great accuracy and exactitude, as the tube can be placed just where it is desired, and greater force than would otherwise be safe can be used. The instruments I have employed consist of a long pair of urethral forceps, with the jaws somewhat bent so that they would grasp the tube by the head and hold it firmly. The smaller ones were placed through the Jackson speculum, and the larger ones through the Jackson speculum with the slide removed, or through the Ingals open speculum.

Dr. Mosher has improved and enlarged the armamentarium of this method, and it will prove of great advantage in cases of chronic stenosis. My cases were done mostly under cocaine anaesthesia, and without the use of an obturator, as on account of their nature there was no need for it.

Dr. W. K. Simpson: I have been much impressed with presentation of this instrument. I have wondered what was the advantage of the direct over the indirect method of intubation, and am glad to hear Dr. Winslow's remarks, but I think he is wrong in saying that the direct method is the only way by which intubation may be done with absolute accuracy. The self-same result can be obtained with indirect intubation, for the sense of feeling and touch is very accurate, and in the great majority of non-diphtheretic cases, it is better to intubate with the aid of the laryngeal mirror. It is my impression that you can exert more pressure by the indirect method than by the direct; I would like to know if any one has had any experience in the intubation

of children by the direct method. I should judge that the time required would be some objection to it.

Dr. J. P. Clark: I have used Dr. Mosher's instrument and found it very useful in a case of stenosis of the larynx in a child. He had had diphtheria in Turkey, 5 years before I saw him, and had a tracheotomy done, and had been unable to breathe without the tracheotomy tube since. I treated him by prolonged intubation, and found Dr. Mosher's instrument very useful in introducing and removing the tube. Incidentally the child now breathes well without any tube and has a fairly good voice.

Dr. A. Coolidge, Jr.: In certain cases it is of great advantage to be able to intube a larynx under direct inspection. For instance, in stenosis of the larynx or in papilloma, the local obstruction may be better understood and the respiration better maintained during the selection and adjustment of the proper tube, than when guided by touch alone. The direct inspection of the interior of the larynx is in many cases easy, both for the patient and for the physician, and with this instrument direct intubation will often be a simple operation.

Dr. W. K. Simpson: I maintain that you can see with the aid of the mirror, and the moment you put the tube by the direct method into the larynx your field is as much obscured as if you used a mirror.

THE NASAL PHENOMENA OF NEURASTHENIA.

BY CHARLES P. GRAYSON, M.D.

I am quite aware that my contribution to our program concerns a subject that may seem of minor importance and even interest, but to me nasal pathology as related to that of many systemic, nutritive and nervous disturbances has always made a special appeal, and I know of scarcely another instance in which the interrelation of the two is so conspicuously apparent as it is in neurasthenia and its associated nasal phenomena. If a noticeable degree of nasal disturbance occurred in only a small proportion of those suffering from neurasthenia, and if it deserved to be regarded as of no more consequence than any other of the many subordinate symptoms of this singular malady, or, perhaps, only as coincidental, then, indeed, I would not have felt justified in asking you to consider this subject with me, but the fact—at least, my experience has led me to believe it one—that in a very large proportion of neurasthenics an appreciable, and in many instances a very severe degree of intranasal neurovascular derangement occurs, and that this possesses not only pathologic, but also, with reference to the neurasthenia itself, very decided therapeutic importance, this sufficiently warrants, I think, my introduction of the subject.

There is, in all probability, a considerable number of these cases in which it is not sufficiently aggressive to compel recognition, but this does not at all lessen its ill effects as a complication. If I needed any further excuse, would it not be found in the appalling, I had almost said the annoying, prevalence of neurasthenia? I think it not unlikely that many of us have found that if there is one type of patient that gives us more care and disquietude than another, it is the neurasthenic, and it is the rapid numerical increase of this type that properly claims for it some special consideration.

Recent neurology, I believe, draws a rather sharp line between inherited or essential neurasthenia and that which is acquired or

more or less voluntarily assumed and which is, indeed, scarcely more than symptomatic of an auto-intoxication which exerts its pernicious effects upon the higher nerve centres. In the first class there is a congenital lack of neuronic energy; in the second, a wilful waste or poisoning of it. To the rhinologist there is little practical difference between the two. In both the nasal phenomena are largely the same and are so unmistakably of nervous origin that they should never fail of recognition. In this connection, however, is it not almost as surprising as it is regretable that, with the single exception perhaps of hay fever, so few general physicians and even neurologists recognize the distinction between the ordinary catarrhal inflammations of the nasal mucous membrane and its disturbances of neuro-vascular nature, a distinction which the rhinologist has so often drawn and so many times emphasized? Similar as they may be symptomatically, we are fully aware of their wide pathogenetic and pathologic differences. And perhaps this may not be an inopportune moment for me to recall a few of the features that differentiate hay fever from the nasal disorder of neurasthenia. We are all familiar with the patient who suffers from a seemingly mild grade of hay fever, not only during the season appropriate to that disease, but at any period of or, indeed, throughout the rest of the year as well. His discomfort may be continuous or remittent or intermittent. As a matter of fact, such patients are often most comfortable during the very season at which supposedly they should be most afflicted, and there is surely much significance in the fact that they may be noticeably relieved by the out-of-door life of the Summer, their absence from home, perhaps, and the physical and mental diversion that we usually enjoy at this time. It is noticeable also that very few of them exhibit any abnormal sensibility to the irritating principles of eitlier plants or animals. It is at once evident then that a broad line of distinction can and should be drawn between these patients and that other large class, the members of which display a hypersensibility to irritants of external origin. Those of whom I speak can, on the contrary, walk unharmed through Summer fields or conservatories filled with flowers, can enter stables or caress cats with no development of nasal irritation nor aggrava-

tion of that which may already exist. Whatever the disturbing factor may be, therefore, it is quite obvious that it comes wholly from within, and in passing, I may call attention also to the fact that its action, instead of being peripheral, as in the case of hay fever, may be central. And I think that this is the more likely because certain of the evidences of peripheral irritation that are present in rhinitis hyperesthetica are conspicuously mild, or even absent, in the nose of the neurasthenic. The sneezing, for instance, is far from being either as frequent or violent; there may be no secretory disturbance worth mentioning, and the lachrymation and the itching at the inner canthus of the eye and in the roof of the mouth are apt to be entirely wanting. In spite, however, of the absence or insignificance of these symptoms, the actual conditions within the nose are as strongly marked in neurasthenia as in the periodic violence of hay fever. The vasoparesis and the infiltrative tumefaction of the turbinates have seemed to me at times even more extreme, and so complete has been the vascular stasis that I have frequently incised the edematous turbinates, permitting the escape of a quantity of serum that was no more than very slightly tinged with blood. Is not such an intranasal condition as this quite sufficient in itself to account to a great extent for the almost continuous headache, the mental apathy and even the melancholia of neurasthenia?

It is for this reason that I say that its relief is of decided therapeutic importance as furthering the cure of the central nervous derangement. Although neurasthenia may be a disease without a pathology of its own, yet it is unquestionably capable of so crippling or turning from their normal course certain physiologic processes that in time they may be caught in the current that sets towards the rocks of pathology. May not, for instance, the fibrillary contractions of a defectively innervated muscle or group of muscles lead in time to such actual pathologic change as a progressive muscular atrophy? Something akin to this happens in the nose. At first there are transient hyperemias and moderate turbinate engorgements, accompanied by dull headaches, neuralgias and even now and then by a sort of pseudo-asthma. Later, the arterio-venous balance is more severely disarranged and for longer periods, serous extravasation occurs and

the paroxysmal functional disturbance of the beginning ends in a persistent vascular paresis, with all that this brings in its train. I do not say that I have seen many such cases, but I have had the opportunity of studying a sufficient number to justify me, I think, in not only believing in the reality, but in the frequency of this distinctly neurasthenic type of nose. I believe also that if it and the mental depression occasioned by it be ignored, they will prove a serious hindrance to the success of any general treatment of the neurasthenia. As to the local measures of relief, it has seemed to me that cauterization alone is of scarcely any value, but that if the serum distended turbinates are first drained by free scarification or by multiple puncture, and this be followed by the application of the chromic acid crystal or the galvano-cautery electrode, a very prompt, decided and prolonged impression will be made upon the inert tissues. To such occasional cases as those for whom we may be permitted to prescribe something of a general nature, I am apt to give the glycero-phosphates of lime and soda in combination with full doses of strychnine, and it is often most gratifying to observe the rapidity with which the general improves upon the relief of the local condition. At least an approximate analogy exists between the results of local treatment in these cases and those following the removal of adenoid growths in children. In the one as in the other it is, as a rule, the extraordinary mental transformation that is most striking, and in both cases it is largely due, no doubt, to the exchange of nasal for mouth-breathing, and to the accelerated venous and lymphatic circulation between the nose and the cranial cavity. I spare your patience the report of any of my cases, first, because I am confident that you have all had similar ones, and secondly, because it is only the conclusions that I have drawn from mine that I wish to submit to your judgment.

Discussion.

Dr. B. R. Shurly: There are always a multitude of cases that come under our observation which are classified under the term neurasthenia, and this is exhibited in so many forms and varieties that from the standpoint of the laryngologist and internist it has always been a matter of great interest to me to try to determine

what we can do for these patients. They are, perhaps, the most abused of all the cases that come under the observation of the different specialists. During the last year I have been interested in some problems along this line. Some time ago it was my privilege to make some observations on carrier pigeons after a long flight, taking sections of the spinal cord, and observing under the microscope the action of fatigue; as you look at the larger nerve cells you can observe an absolute change has taken place in the fine granulations of the cell, and there is a complete change in the spinal cord of the pigeon that has been over-fatigued, and one that has been at rest. In all these cases there is a definite condition, I am sure, that will explain the different vasomotor neuroses so frequently presented to us.

Another class of cases that came under my observation has been demonstrated to be due to actual change in the internal secretions. This is in the line of physiology, and we are just beginning to understand that a large number of these so-called neurasthenias are cases of atypical Graves's disease and atypical myxodema. The changes in the throat and voice which we note in cases of early exophthalmic goitre are striking when we associate them from the point of view of the internist and the laryngologist. There is much in internal medication along this line of work.

There is a drying of the air passages in some of these neurasthenics which responds promptly to properly regulated doses of sheeps' thyroids, and this preparation is just as different in its action from the ordinary commercial thyroid as possible. Again, the exhibition of iodine is often of very great value in regulating this condition. Many of these thyroid conditions are due to the loss of balance of the governing influence of the thyroids, pituitary bodies, pancreas and other internal secretions, and by supplying the deficiency to the body when indicated we have a valuable therapeutic aid.

Dr. J. Solis-Cohen: In view of some of the remarks the President made in his speech, I would like to refer to the observations just made with regard to the internal secretions. Dr. Sajous, a former member of our society, who is at present in the lead in this investigation, recently stated at a dinner given in my honor that his work proceeded as an outgrowth from laryngology—that the attention paid to thyroid cases when he was in my clinic had led him first to thyroid studies.

Dr. J. P. Clark: I do not wish to have any one think I do not believe there may be cases in which the nasal symptoms are due to what we term neurasthenia, but none of us, I think, feel entirely satisfied in making a diagnosis of neuras-

thenia, and if we could find some physical condition which would explain the appearances in the nose, such as Dr. Grayson has described, we should be pleased. The more we know of nasal conditions, the more cases we will be able to remove from the classification of neurasthenia. I have seen a few cases in which the symptoms were very similar to those described by Dr. Grayson—watery secretion, congested turbinates, inability to breathe through the nose—in which I found one or both antra containing a thick tenacious mucus of such a consistency that it came out in a solid mass, and by clearing out the antra in these cases I have gotten entirely rid of the local symptoms that were affecting the patient's general health. This is a class of cases in which the condition of the antrum may be easily overlooked and the symptoms attributed to neurasthenia. I reported two such cases at a meeting of the New England Otological and Laryngological Society on March 30, 1910, but the paper has not been published yet.

Dr. R. C. Myles: The phenomena presented by the nose in cases of neurasthenia, such as described by Dr. Grayson, have occurred in many of my cases. The cause has sometimes been of constitutional and at others of a local nature. I have had a case produced by sarcoma of the upper part of the septum, the sphenoid and the ethnoid region, and I have seen many cases where the antra were at fault. I have seen other cases where the general condition produced a bilateral intumescence, the neurasthenic conditions being associated with intestinal toxaemia, where surgical procedure relieved the breathing, but not all of the symptoms and deeper sinus lesions. So the difficulty seems to be in differentiating at the outset the proper measures of relief for these cases. They do not stand manipulative procedures well, and often become profoundly depressed after operation. Certain types of them should be referred to the general physician to be relieved of their toxaemic conditions.

Dr. H. L. Swain: I have been thinking that in this matter we ought to bear in mind that attention has been called to some anatomical conditions or actual structural deviations from the normal in the mucous membranes in those persons who suffer from rhinitis or disturbed internal secretions. I am confident from the work which I have done in the study of cases of oedematous rhinitis that these patients have thinner vessel walls, less fibrous connective tissue distributed through the membrane, and fewer of the muscle elements which contract than in other pathological conditions. The lack of firmness in texture of the vessel wall, coupled with the hyperaesthetic nerve endings, and constitutional conditions cause these neurasthenic conditions in the nose. I believe, with Dr. Shurly, that in the different types of thyroid disease—called exophthalmic goitre and myxodema—

though the phenomena are quite unlike, both cause nerve tire, which is perhaps the real significance of the word neurasthenia. We lead very tense and hard lives in these days, and it is very easy to get these neurasthenic conditions, and if you have the physical changes in the histology of the nasal mucous membranes it is easy to conceive the pictures drawn by Dr. Grayson of its pathological complex.

Dr. Grayson: I should not for a moment presume to make a diagnosis of neurasthenia simply from the nasal conditions. It is only my belief that a large proportion of such cases manifest the phenomena I have recorded. Such phenomena may, of course, be due to other conditions; there are many toxaemias, for instance, in which you find engorgement and oedema of the turbinates, but these are apt to be transient. In the cases of which I have spoken the conditions have been persistent for months; they have been remittent or intermittent at times, but many were absolutely continuous. These must have been due to something else than autotoxaemia alone, for they were under general treatment and had undergone considerable general improvement, yet the local condition continued. Of course, I made very few suggestions regarding treatment. The need for hygienic treatment goes without saying and this should be carried out by the physician in charge. The comments of Drs. Shurly and Swain have a decidedly practical bearing upon the understanding of the phenomena I have described, and will be of material assistance in making our local treatment intelligent and rational.

EXOSTOSES OF THE ACCESSORY SINUSES.

BY HARRIS P. MOSHER, M.D.

About two years ago in the routine examination of heads as they came from the dissecting room I found my first specimen of exostosis of the accessory sinuses. Last Summer I removed from the right frontal sinus of a young physician an exostosis over half as large as the last joint of my thumb. Last Summer, also, during a Killian operation for chronic infection of the right frontal sinus, a long, thin exostosis was found lying in the naso-frontal duct, and practically making a cast of it. These exostoses discovered at operation led me to re-examine my specimens and to look over a new supply which became available at that time. In all something like two hundred heads were examined. Nineteen specimens of exostoses of the accessory sinuses were found.

From the finding of such a number of exostoses it would seem that these growths are not very uncommon. All the exostoses, however, were small, and I should have considered them insignificant had not the huge exostosis which was found in the frontal sinus of the physician been attached to the sinus wall by a pedicle, which was no larger than the pedicles of the smaller exostoses found in the specimens. The ovary is a small organ, but it gives rise to gigantic cysts. It would seem that the growth of exostoses in the sinuses is analagous, as far as size is concerned, to the growth of ovarian cysts. The exostoses rise from small structures, have small pedicles, and attain in the end a size much greater than that of the structure from which they spring.

As far as my specimens go it would seem that exostoses are equally common in the frontal sinus and in the sphenoid. They were found but once in the antrum, whereas no example of an exostosis of the ethmoidal labyrinth was discovered. In the

frontal sinus the growth occurs oftenest as a small, pedunculated knob; in the sphenoid it is more often needle-like and sharp. In all of the specimens, except one, the exostoses were small, measuring not over three or four millimetres. The single specimen found post mortem which exceeded these measurements was as large as a fair sized pea. (Fig. No. 1.)

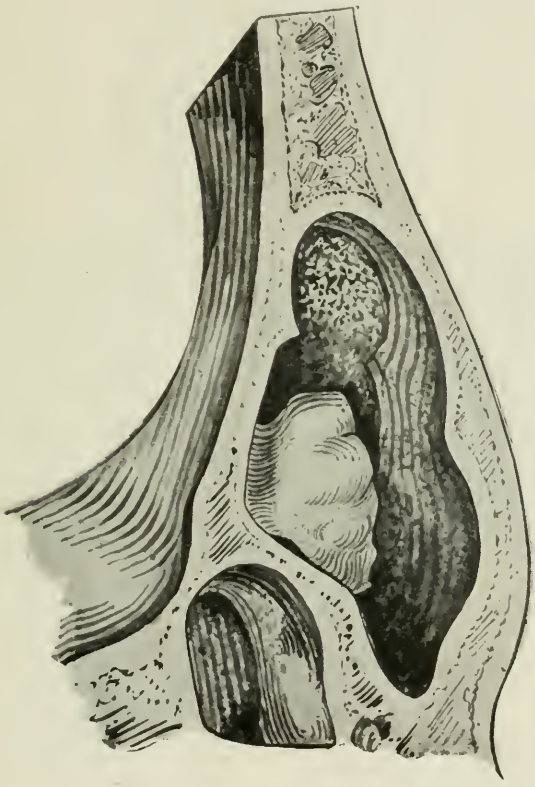


Fig. 1.

Exostosis as large as a fair sized pea springing from the posterior wall of the frontal sinus. (From a chart drawing by the writer.)

Exostosis of the Frontal Sinus.

As a rule, in the majority of specimens the bony walls of the frontal sinuses show no change from the normal. When, how-

ever, any departure from the normal is found it occurs in one of two forms; either a more or less generalized, mammillated growth (Fig. No. 2) or a single knob-like projection (Figs. Nos. 3 and 4.) The first formation is consistent with a generalized periostitis, and might readily be due to a long standing suppurative process in the sinus. The second formation, which is the one which more directly concerns us at the moment, is an exostosis. In the frontal sinus examples of exostoses of the front wall, the posterior wall and of the inferior were discovered. As yet I have not found an exostosis springing from the floor. In most specimens the exostosis was on the anterior wall. Whether on the anterior or on the posterior wall, the pedicle was located near the median septum.

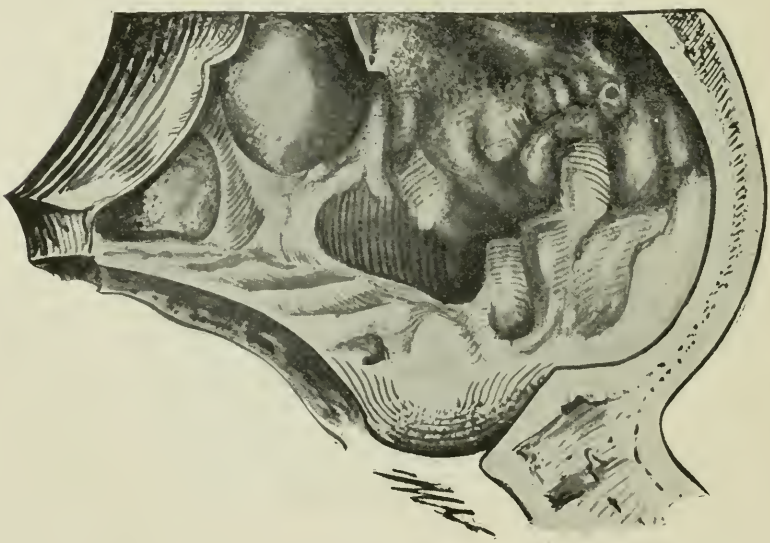


Fig. 2.

Mammillated growths on the anterior wall of the frontal sinus.

Exostosis of the Sphenoidal Sinus.

The specimens of exostoses (Figs. Nos. 5, 6) found in the sphenoidal sinus are for the most part needle-like spines. Only one or two knob-like exostoses have been discovered. This is

just the reverse of what was found in the frontal sinus. Further, the partial partitions which occur in the sphenoidal sinus often have sharp edges crowned in places with spines. Septa of this character I have found in other sinuses.

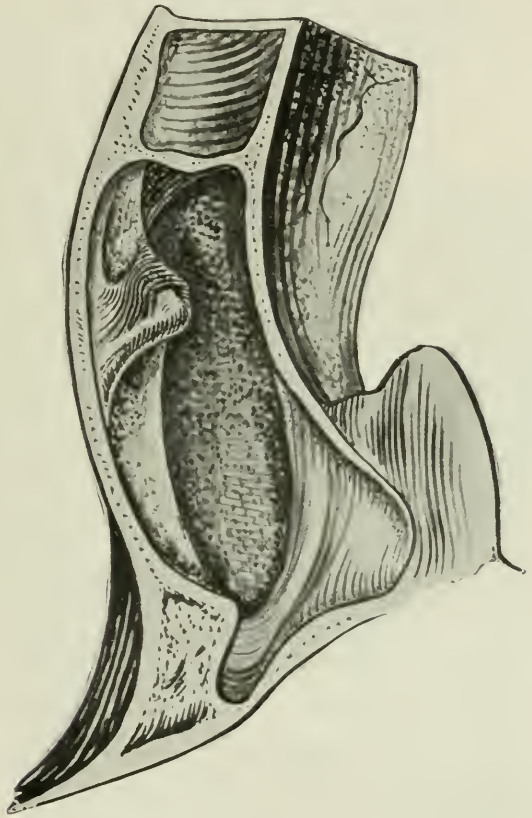


Fig. 3.

Knob-like exostosis springing from the anterior wall of the frontal sinus.

Etiology.

Little, if anything, is known concerning the etiology of exostoses of the sinuses. Zarniko mentions them, and divides them into two classes. In the first class the writer

states that the growth springs from the diploe of the bone; in the second, from the periosteum. Cases are recorded, he says, where an exostosis of the ethmodial labyrinth has filled the whole nasal cavity and finally spread apart the nasal bones. Beyond this classification Zarniko does not go; he says nothing about etiology. It would seem reasonable, however, that the cause of certain of these growths might be found in trauma. This would apply especially to the frontal sinus, because here the anterior wall is continually exposed. The

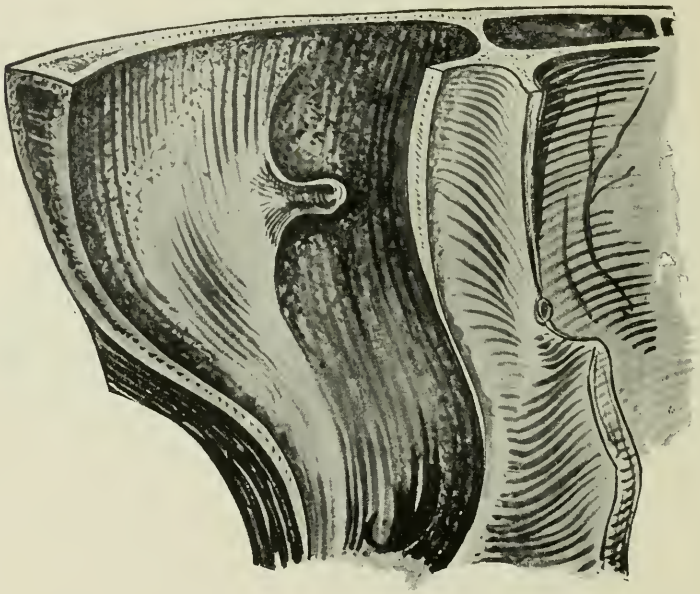


Fig. 4.

Pedunculated exostosis springing from the anterior wall of the frontal sinus.

fact that the majority of exostoses found in the frontal sinus occur on this wall also fits in with this explanation. In the nose the anterior edge of the perpendicular plate of the ethmoid often is thickened and covered with small, bony elevations. As the anterior part of this plate acts as a buffer for blows received by the quadrangular cartilage, I have felt that this roughened con-

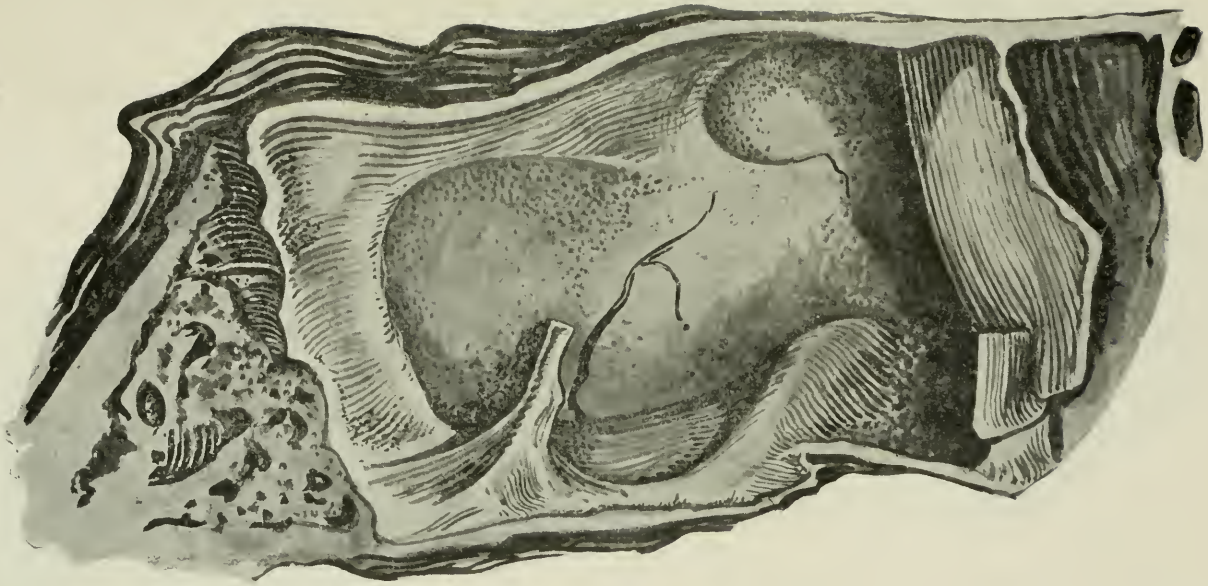


Fig. 5.

Spinelike exostosis springing from the floor of the sphenoidal sinus.

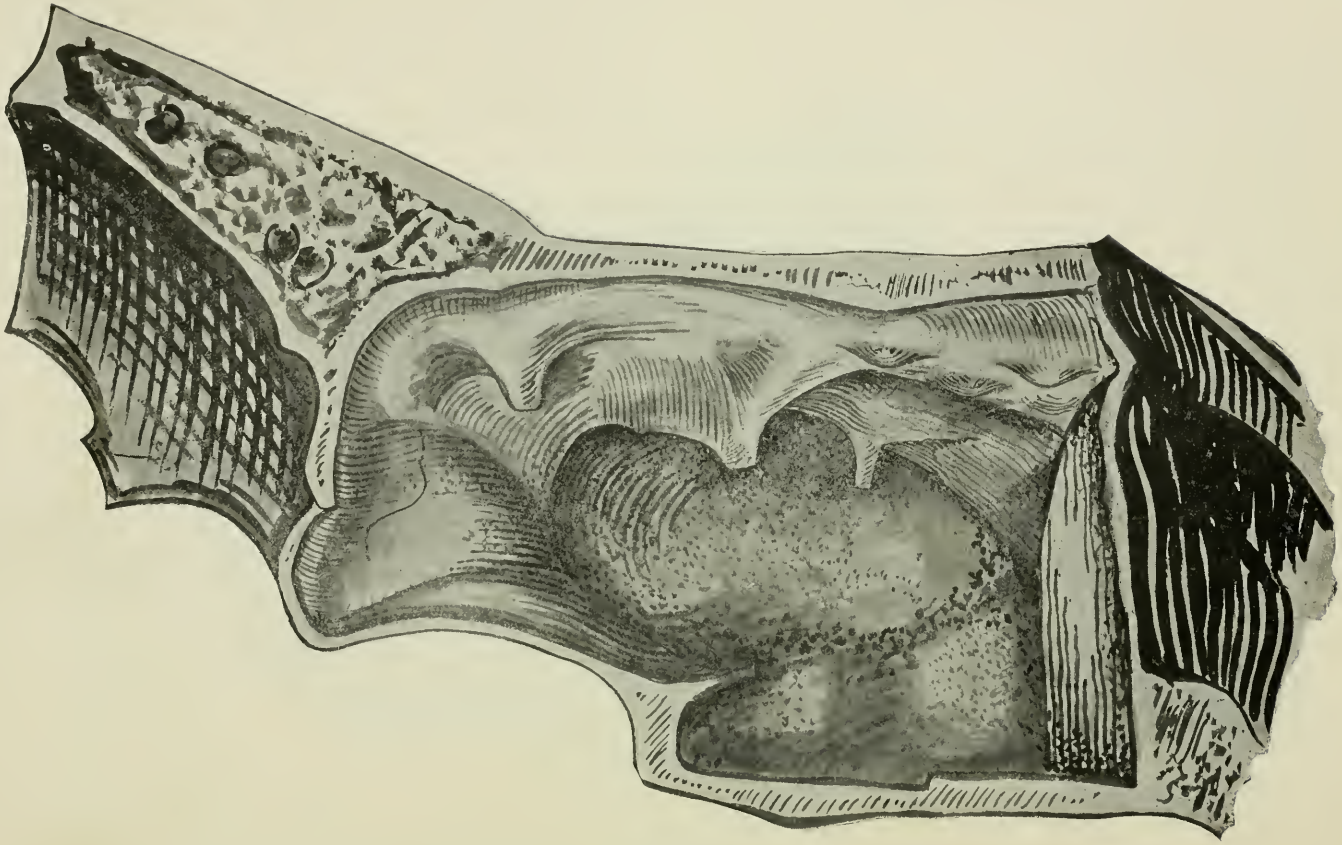


Fig. 6.
Three spinelike exostoses springing from the floor of the sphenoidal sinus.

dition was the result of periostitis caused by trauma. In considering the cause of the huge exostosis found in the frontal sinus of the young physician trauma seems the most probable. During his college course he was a prominent football player and played on a noted eleven. The games in which he figured were more than ordinarily strenuous, I might say vicious. He remembers repeated injuries to the forehead, and in one of his last games he received a blow which was unusually hard, even for this game. In this case, therefore, trauma seems a likely cause for the exostosis.

In other papers and in other discussions I have referred to a condition called hemorrhagic sinusitis. I feel that this may play a considerable role in certain diseases of the sinuses. Some day I hope to take up the subject and find out how much there is in it. The condition exists, because at operation I have found it several times. This is all the actual information which I have at present about it. Passing for a moment, however, to the dangerous field of speculation, immediately certain possibilities suggest themselves. For instance, it is not hard to conceive of localized areas of hemorrhage in the mucous membrane, the hemorrhage resulting from the rarefication of the air in the sinus, caused by the inflammatory closure of its duct. Hurd recently reported a case which might be explained in this manner. Given a small hemorrhage in the mucous membrane, its organization and subsequent calcification might start an exostosis.

The foregoing paragraphs are all that I can at present say about exostoses of the accessory sinuses. The specimens and the drawings make further comment unnecessary. I should like, however, to turn from the anatomical findings and for the rest of the paragraph refer to the clinical side of the case of the former football player. He came to me having previously had trouble with the left antrum. At intervals he still had a discharge from the left nostril. As a matter of routine, an X-ray was taken. This showed a very large right frontal sinus, the cavity of which was nearly filled with an opaque body. On seeing the plate a case upon which I saw Dr. Coakley operate at once came to mind. In this instance the right frontal

sinus was found to be filled with a large, lobulated, yellow polyp. It looked so much like an oyster that the comparison instantly occurred to every one. Naturally I thought that in my case some such polyp was in the sinus. There were, however, no symptoms. The plate alone drew attention to the right side. I did not dare to leave the sinus unexplored. This view of the case proved to be justified because when the sinus was opened the question of osteo-sarcoma at once intruded itself. The question was not settled until sometime later, when, to my great relief, the microscopical examination of the specimen showed that the mass was composed of normal bone. The exostosis was so large and hard that I was compelled to remove the upper part of it piecemeal. The lower half I was able to pry out whole. The mass proved to have a pedicle about three millimetres in diameter, and it sprung from the lower part of the anterior wall of the sinus near the median septum. On the posterior wall there was a second small exostosis. This was chiselled away. Not knowing how thin the posterior or the cranial wall of the sinus might be from the erosion of the large mass, the morcellation of the tumor was very slow. The removal of the tumor and the Killian operation which followed it occupied over three hours. When the mass was finally removed it was found that the median septum had been forced strongly to the left, and the mucous membrane over it was bluish from pressure, and the partition itself just on the point of breaking. Fearing that it would necrose, I removed it. A radical opening of the antrum finished the operation.

Besides the rarity of such a large exostosis, the following points in this case are of interest: The lobulations of the mass made it impossible to remove it entire, the mass had a very small pedicle, and there was a second beginning exostosis on the posterior wall, possibly due to the trauma caused by the large one; and finally, a burr driven by a dental engine would have made the morcellation of the tumor quicker and much safer.

A PRELIMINARY REPORT OF INTRANASAL DECOMPRESSION IN A CASE OF TUMOR OF THE HYPOPHYSIS.

BY NORVAL H. PIERCE, M.D.

It is not my intention at the present time to make a complete report of the case you see before you, as this will be done by Dr. William Halstead at the forthcoming meeting of the American Surgical Association. My purpose now is to place on record first the preliminary intranasal decompression which resulted in improvement of the condition of the patient, and, second, as an outgrowth of that preliminary procedure, the suggestion of a possible intranasal operation for the purpose of reaching certain growths of the hypophysis without external or oral incision.

The patient, an adult male, came to the eye department of the Illinois Eye and Ear Infirmary (Case No. 27835), April 7, 1909. He was suffering from diplopia, increasing blindness and headache. Dr. D. W. Orcott referred the patient to me for the purpose of nasal examination, and later had him transferred to my service, believing that there might be a growth in the sphenoid sinuses.

April 9th I operated. On examination I found that the anterior half of the middle turbinate on the right side had been removed. As there was a muco-purulent discharge coming over the remaining posterior portion of the middle turbinated body, I removed this and explored the posterior ethmoid cells, but found nothing of material importance there. I then removed the anterior wall of the right sphenoid cavity. The cavity contained a slight amount of muco-pus, but its lining membrane was pale and smooth. The striking feature about the appearance of the cavity was the small antero-posterior diameter, the inner wall being separated by a very narrow space from the outer wall. When touched with a probe the inner wall conveyed a

distinct sensation of bogginess to the hand. No tumor of the spenoid cavity being discovered, operative procedures ceased. Immediately following this operation the patient's condition became greatly improved. The headache, which before was nearly intolerable and prevented sleep, almost disappeared, and the patient declared his sight was increased. This improvement lasted two weeks, when the headache recurred with increasing violence. While the significance of the operation at that time was not fully appreciated, and the cause of the patient's improvement was not quite clear to us, in the light of further developments, the benefits experienced by the patient as regards headache and improved vision must be ascribed to the relief of pressure due to removal of the anterior wall of the right sphenoidal cavity. I am, therefore, justified in putting this case on record as one in which decompression was performed through the natural nasal orifices in a case of hypophyseal tumor—the first on record so far as my knowledge goes.

Shortly after this the illuminating paper of Dr. Archibald Church on tumors of the hypophysis appeared in the Journal of the American Medical Association. The diagnosis, based on the three cardinal points—hemianopsia, headache and loss of sexual power—became clear. I thereupon transferred the case to St. Luke's Hospital, where Dr. Church saw the patient and concurred in the diagnosis after confirming the symtomatology by several excellent skiagraphs. The tumor was reached by the nasal route, the nose being turned upward by an incision through the mouth. As you may see by observing the patient there is no deformity. He is now free from headaches, his vision with glasses supplied by Dr. Cassius Wescott is R. E. 6-12, L. E. 6-22, and he has returned to his work.

However, as I said at the beginning of my remarks, it is not my intention to make a full report of this case. My present purpose is first to place on record the benefit—though of very short duration—derived from decompression through the natural orifices of the nose without external or oral incision, and, secondly, as an outgrowth of that experience, to suggest that certain growths of the hypophysis, such as cysts and tumors like

the one proved to be in the present case, might be removed in the same way; that is, without external or oral incision.

At the time of operation at which this tumor was removed I was struck with the very slight increase in space the turning up of the nose gave us for surgical manipulation over that at our disposal with the nose in place. I am now speaking, of course, from the standpoint of the rhinologist.

If such an operation were performed as I suggest through the nasal orifices without external or oral incision, it should be divided into two parts.

First Stage.

1. Local anesthesia with adrenalin.

2. Removal of at least both middle turbinal bodies, and, if necessary to secure free vision, removal of one or both inferior turbinal bodies.

3. Removal of the septum between the following lines: a. a vertical line drawn downward to the floor of the nose from the glabella. b. A horizontal line drawn backward from the lower anterior margins of the nasal bones to the body of the sphenoid bone. c. A diagonal line which intercepts the lower extremity of the line a. and ends at the point where the vomer joins the sphenoid. Flaps from the mucus membrane may be preserved to cover the cut edge of the septum. The septum may best be removed with cutting forceps and chisel.

4. Removal of anterior walls of both sphenoid cavities and removal of the dividing septum. This is done either by means of the punches already employed for this work or by means of specially constructed chisels.

5. Packing nasal cavity with xeroform gauze.

After healing is well under way we proceed with the

Second Stage.

1. Anesthesia, local or general, with adrenalin.

2. Removal of the inner wall of the sphenoid and exploratory puncture of walls of tumor. If it is cystic, drainage. If solid, removal with curet.

For exploratory purposes and for cystic tumors this would seem to be the ideal method of operation. With solid or semi-solid tumors, the objection might be raised that we would be unable to adequately outline the growth or remove it in its entirety. The same objection might be urged against all other methods, temporal, transtemporal or frontal. As a matter of fact certain tumors of the hypophysis which display histologically sarcomatous characteristics tend to involution if only a portion is removed. Again, the directness of this route cannot be gainsaid, as most frequently when the hypophyseal growth comes to operation it has either pushed the inner wall of the sphenoid sinuses forward or by pressure atrophy has caused its dehiscence. In cases of acromegaly this method would seem to be especially applicable, as great improvement in the general condition is known to have occurred after simple incision of the membranes covering the hypophysis.

Discussion.

Dr. J. N. Mackenzie: I desire to call attention to the fact that, among others, Dr. West, my assistant in laryngology at Johns Hopkins, has developed a method of reaching the hypophysis by the intra-nasal route which he claims to be superior to other methods in that it accomplishes it with the least possible destruction of tissue and that the greater part of the procedure can be carried out under local anesthesia. His observations have already been published in the Journal of the American Medical Association, April 2, 1910.

Dr. R. C. Myles: I have treated three cases in which tumors involved the sphenoid and where it was necessary to remove the septum. In two of the cases I was associated with Dr. Bodine. The nasal bones were moved to one side. The septa were completely removed from the anterior to their sphenoid attachments. This proved better than any other method for exposure and manipulative technique on the sphenoid. The sphenoids were easily entered and the tumors removed, leaving a large open space for inspection; the hypophysis was plainly seen and could have been easily entered if it had been desired to do so. In the other case, the septum was removed through the nasal vestibule and a splendid view with easy access was obtained. I was very much impressed with the broad field for operative procedure.

Dr. J. Gordon Wilson: I would like to state that Dr. Norval Pierce reported this case and discussed the intra-nasal route before the Chicago Laryngological Society at the end of last year.

Dr. Pierce: I have only a word to say on the point of priority in regard to the nasal route for reaching tumors of the hypophysis. I made public the operation as it appears in this paper in November of last year, but on account of delay on the part of the secretary it was not printed, although the paper was sent to the Laryngoscope with the transactions of the November meeting of the Chicago Laryngological Society. It is not for the question of priority that I contend, I simply wish to present this new and interesting subject.

QUININAE AND UREA HYDROCHLORATE
(Syn. Quininae-Carbamidum, Urea-Quinine.)
AS A LOCAL ANAESTHETIC

BY E. FLETCHER INGALS, M.D.

In the Journal of the American Medical Association, October 23, 1909, there appeared a short article by Drs. A. E. Hertzler, R. B. Brewster and F. B. Rogers on the use of Quinine and Urea Hydrochlorate as a local anaesthetic. They referred to an article by Dr. Thiebault, 1907, who recommended a 1 per cent solution for local injection and from 10 to 20 per cent for local application to the mucous membranes. They also referred to an article by E. J. Brown, Journal American Medical Association, August, 1908. He recommended this drug in tonsillectomy and adenectomy. Thiebault found that after the injection of a 1 per cent solution, perfect anaesthesia was obtained that lasted four or five hours. The authors of the more recent article, as a result of their clinical and experimental use of this drug, confirmed the former reports, and Hertzler claims that after injection of ½ to 1 per cent solutions, immediate and perfect anaesthesia occurs and lasts for four or five days, and that complete restoration of sensation may be delayed for from ten to fourteen days. They found this drug an efficient and safe local anaesthetic when injected in solutions of from ¼ to 1 per cent in water; but the 1 per cent solution caused undue fibrinous exudation, with induration that appeared to interfere with primary union in some instances; yet in other cases this was an advantage by tending to check hemorrhage. They suggest a solution of from 10 to 20 per cent in strength as an anaesthetic when applied to the surface of the mucous membrane. One hundred grains of this drug were injected into the veins by Brewster in the course of six hours, in a case of pernicious malaria, with recovery of the patient.

For a long time I have been searching for an agent that would produce prolonged anaesthesia of the mucous membranes, for the relief of hay fever and hyperaesthetic rhinitis, therefore I grasped eagerly at this and began at once using it in my ordinary operative procedures in the nose; but owing to the season of the year, I had no opportunity to try it carefully in either of these extremely sensitive conditions. At first I tried a 20 per cent solution of the Quinine and Urea Hydrochlorate in water as a local anaesthetic for the nasal mucous membrane. I found that this solution was too concentrated for satisfactory use, as it crystallized when the water became cool; but it produced complete anaesthesia, though it required about four times as long to obtain this result as with the 20 per cent solution of cocaine in 1 to 1,000 of suprarenalin. At first, after the anaesthesia had been obtained, I applied the suprarenalin solution 1 to 1,000 to prevent bleeding, but the results were not satisfactory. I did not use the two together, fearing that the suprarenalin would interfere with absorption of the anaesthetic. I then tried combining the Quinine Urea Hydrochlorate in solution with the suprarenalin, and found that, although slow in action, it caused perfect anaesthesia and prevented bleeding. Desiring more rapid action, I next combined 15 per cent of the Urea Quinine with 5 per cent of cocaine hydrochlorate in a solution of 1 to 2,000 of suprarenalin. This produced anaesthesia as quickly and sometimes apparently more quickly than a 20 per cent solution of cocaine in 1 to 1,000 of suprarenalin, and the anaesthesia was more prolonged. However, I have not been able to determine the duration of the anaesthesia. This solution turns to a brownish color after a few hours, but it seems to work about as well as when first made up, excepting that the activity of the suprarenalin appears to be somewhat diminished. It would probably be better to combine the solutions just as they are to be used, but the other plan works so well that I have continued to use it to avoid the trouble of preparing the solution each time.

From my experience in many cases of deep cauterization of the turbinated bodies in which I have used this anaesthetic on

the mucous membrane, I have the impression that considerable anaesthesia lasts for several hours, but I have not obtained such prolonged anaesthesia as reported by Hertzler, who used it hypodermically.

In the treatment of intumescent or hypertrophic rhinitis I have used this anaesthetic many times before making long, deep, linear cauterizations across the inferior turbinated body, and have had profound anaesthesia in every case. After cauterizations of this sort, where cocaine or cocaine and suprarenalin have been used as an anaesthetic, the reaction is generally so great that when the patient returns at the end of four days after the cauterization, the affected naris is much obstructed by a mass of inflammatory lymph about 4 c. m. long, about 1½ c. m. wide and from 2 to 4 m. m. in thickness. This renders it necessary to pass a probe between the turbinated body and the septum to prevent adhesions; but after using this new anaesthetic, with the same sort of cauterization, there has been much less reaction, and we have seldom seen more than from 25 to 50 per cent as much of this inflammatory lymph. This fact seems to indicate that the new anaesthetic minimizes the reaction.

I have used this same solution in the larynx, trachea and bronchi in connection with ether anaesthesia, in six bronchoscopies in children, for the removal of foreign bodies from the lungs, without any unpleasant results, and I have not hesitated to use it freely. In one of these patients, fearing the necessity of a tracheotomy, I first anaesthetized the region over the trachea with a few drops of the same solution diluted thirty times with distilled water, but as tracheotomy did not become necessary, I could not judge accurately of the extent of the anaesthesia; however, the hypodermic use of the anaesthetic did not affect the little patient unpleasantly.

I have used the same solution, diluted about fifteen times, submucously, in connection with topical applications in the nares in three or four cases. In one of these, where a painful operation on the posterior ethmoid cells was done, it gave excellent results, and in the others the anaesthesia appeared to be

more complete than could be obtained by applications to the surface alone.

I have used this anaesthetic for turbinectomies, for the removal of polypi and in several operations for removal of spurs or ridges from the septum or for submucous resection, with great satisfaction. In all of these cases it appears to me to have acted much better than a 20 per cent solution of cocaine in 1 to 1,000 of suprarenalin solution.

In one instance, where I used it submucously to relieve nasal neuralgia, the patient suffered for several hours afterward from pain, and from her report there appeared to have been much swelling of the nasal mucous membrane. I had one patient with hyperaesthetic rhinitis, to whom I gave a 10 per cent solution of Quinine and Urea Hydrochlorate, but she complained that it smarted so badly that she was unable to use it; but I have tried it in fairly healthy nares in solution in distilled water, and in Dobell's solution, and found that a 10 per cent solution could be borne by very sensitive persons and a 15 per cent solution in ordinary cases.

I have tried this drug in the nares triturated thoroughly with sugar of milk up to a strength of 5 per cent, which appeared as much as could be easily borne by the ordinary person; 4 per cent seemed as strong as could be used comfortably by those with very sensitive mucous membranes.

This is a very valuable local anaesthetic, but my experience does not lead me to anticipate very much benefit from its use in either hyperaesthetic rhinitis or hay fever; however, in view of the claims that have been made for it in producing prolonged anaesthesia, and in view of the old treatment of hay fever by nasal applications of a solution of quinine, I think it well worth while to give it a fair trial in these affections.

Discussion.

Dr. J. Solis-Cohen: I was for many years in general hospital practise, during which time I have used this drug, under the name of bimuriate of quiniae urea, for remittent fever, especially pernicious remittent fever. This latter is a form in

which, if the patient gets a third chill, he usually succumbs, but if this drug be given in doses of sixty grains or its equivalent by hypodermic injection, it will often prevent further paroxysms. Under its topical use, as recently introduced into practise, I have removed growths from the larynx and applied the electric cautery with as much facility as after the use of cocaine, and in the same patients. I find that in some cases you get as good results as with cocaine, and in others not so good. I have also used it for operations in the rhinopharynx. It is, on the whole, a very satisfactory local anaesthetic in 20 per cent solution. I have also tried the quiniae and urea hydrobromate, but water will only take up about 3 per cent, and this is not sufficiently strong for topical anaesthesia, though it may be as efficient as the hydrochlorate hypodermatically.

In regard to the 20 per cent solution, I would state that the solution made by my apothecary has not crystallized, and that I have used it effectively when as much as fourteen or fifteen days old.

Dr. W. E. Casselberry: I would ask the essayist whether he has had experience with carbamidum in tuberculosis of the larynx in which there is often need for a local anaesthesia more unduring than that by cocaine and more effective than orthoform?

Dr. B. R. Shurly: I used this combination some time ago on the advice of a rectal specialist, who has had most remarkable results with the infiltration of this anaesthetic. I have used it in tonsillectomy only and found that I would often get a remarkable blue line following the line of injection. There was a considerable amount of swelling afterward. After using it on a few cases, and hearing a report from the interior of the State that one of my colleagues had been sitting up all night attempting to control an oedema of the glottis, following the use of a strong solution, I discontinued its use.

Dr. J. Gordon Wilson: I should like to refer to carbamidum from a different point of view. For some years I have been interested in the question of nerve endings. When working on the nerve endings in the larynx and the ear, I experimented with a number of organic compounds to see if it were possible to modify the susceptibility of the various varieties of nerve endings to intra vitam dyes. Among other substances I have used various amides. The impression that these amides gave me was that they produced not a suppression of the nerve function, but a protoplasmic death. Pharmacologists also hold that quinine causes protoplasmic death. For certain morphological reasons which I have referred to elsewhere, pain endings would be more susceptible to these poisons than other

nerve endings. So in carbamidum it is a question whether we have a body producing local anaesthesia—that is, temporary depression of function—or a body producing death of the nerve ending. In accordance with the latter view is the long duration of the absence of pain, which has been described. In this connection I would consider it hazardous to inject carbamidum into a nerve trunk, as can be done with cocaine. This latter drug, as is well known, will, under these conditions, depress temporarily the function of the nerve trunk. Before so using carbamidum we ought to have experimental evidence to show that it will not produce serious degenerative changes, necessitating subsequent regeneration from the centre.

Dr. J. R. Winslow: For the past few months I have done practically all tonsillectomies that I have performed under local anaesthesia, under infiltration with quinine and urea solution, and with much satisfaction. I have not found the percentage advised by Hertzler and others adequate, but have had to use at least 3 to 5 per cent. I do not use adrenalin with the quinine and urea hydrochlorate solution, but find that by making the injection some fifteen or twenty minutes before the operation you not only increase the anaesthetic effects, but eliminate the necessity for vaso-constrictors, and little or no hemorrhage follows the incision. There is considerable swelling and oedema, but I have had no bad symptoms from them.

With regard to the after-anaesthesia and its duration, my experience has not borne out the statements made by various writers. My patients do not admit that they are relieved of the after-pain characteristic of operations on the tonsils. I have had very little experience in this anaesthesia in other operations than those on the tonsils.

Dr. H. L. Swain: If the remarks made by Dr. Wilson in regard to protoplasmic death prove to be true, it would be very satisfactory. If we could get the nerves in a tubercular throat lesion to stay dead until the owner passed away or got well we would have a good addition to our armamentarium.

Dr. J. Solis-Cohen: I have under treatment a very severe case of tuberculous ulcer of the larynx, in which applications of this anaesthetic allowed the patient to swallow comfortably for two or three days, with the result that in the course of a week there was no necessity for making any further applications whatever. A 20 per cent solution was used.

Dr. E. Fletcher Ingals: I am very glad to have brought out this discussion. Dr. Cohen's remarks answer Dr. Casselbery's question. I should like to ask Dr. Cohen how long it took to produce anaesthesia of the larynx.

Dr. Cohen Two or three minutes.

Dr. Ingals: I have found that it often requires fifteen to twenty minutes to produce complete anaesthesia.

As to the discomfort to the patient from submucous injections, I think that when used in the nose there was a good deal of swelling afterward, and that it was very uncomfortable. I have not used it in the tonsils. Dr. Wilson made his suggestions to me a few days ago, and I thought it would be fine if we could kill the nerve endings for a time at least. In my experience the bleeding seemed to be as great after this as after any other local anaesthetic. When I used it by itself it did not even take down the swelling in the nose, and the bleeding was so great that I afterward used suprarenalin with it. Most of my patients seem to have had prolonged anaesthesia, but I could not tell how long it lasted. They did not complain during the first few hours after the operation, as they sometimes do when cocaine has been employed. It appears to me that considerable anaesthesia lasts perhaps ten or twelve hours.

ESOPHAGEAL DIVERTICULA.

BY EMIL MAYER, M.D.

This subject is presented for your consideration because of the difficulties that present themselves in its diagnosis and appropriate treatment.

A pouch or hernia of the esophagus at its posterior junction with the pharynx, called a diverticulum, may be due to pressure from within (over distension) or to pulling from without. The distension or pulsion diverticulum occurs most frequently; usually in males over forty years of age and in the following manner. In consequence of some local influence the muscular fibres of the esophagus became weakened, the constant pressure of the act of swallowing now distends the tube, a sac is formed in which food may remain after deglutition. The weight of these masses distends the sac and it is dragged down behind the esophagus, between it and the vertebral column.

Traction on the anterior wall, due to an inflammatory swelling of the parts immediately adjoining the esophagus causes the form known as pressure diverticulum. The symptoms are those of obstruction to the swallowing of food, and upon the severity of this condition depends the amount of emaciation that may be present. As illustrating the difficulties in the way of diagnosis the recent report of an "Iconoclastic Revision of a Classical Case of Diverticulum of the Esophagus," by C. D. Spivak, of Denver, Col. ("New York Medical Journal," March 12, 1910, page 543), may be cited. This case is quoted as classical in all the textbooks of surgery, was originally recorded by Bychowsky and was claimed to be unique in that the diverticulum was not at the junction of the pharynx and esophagus, but at its lower end. The writer then marvelled frequently upon the continued vitality of the patient in spite of the serious nature and locality of his obstruction. The trouble began when the patient was

twelve years old, and it came on suddenly; at first all food came back as soon as ingested. Later he could eat in comparative comfort, but would vomit a quantity of food after meals. For six years he lived on tea and large quantities of sugar. A piece of meat that he then ate stuck in his throat, being vomited out at the end of the third day. A celebrated gastro-enterologist now treated him for over a year, unsuccessfully. He was then under Bychowsky's care for a year and a half, the latter presenting his findings based upon these observations. The patient declined the offers of celebrated surgeons to have an operation performed. Because of the unique character of his condition the freedom of the clinics of various cities was freely offered him. In Paris he found himself better able to swallow by drinking wine and water with his meals. Coming to the United States, beer took the place of wine, and, finally, necessity drove him to water, and he soon found that water of proper temperature, slowly sipped, enabled him to swallow many different foods. Fourteen years after the commencement of his trouble, this patient came to Colorado on account of lung trouble, entering the sanatorium of the Jewish Consumptive Relief Society at Edgewater, Col., where he came under the observation of Spivak, whose examination showed that tubes introduced came to a standstill at the same distance from the incisors. Finally, however, when a cable was inserted to which a small olive point was soldered, it readily glided into the stomach. The diagnosis of a stenosis on the functional basis of cardio-spasm was now made. The patient died and no diverticulum was found at autopsy. Commenting upon this, the writer says that this case became the basis for a new classification of the pathology of the esophagus and is quoted and referred to in all text books and monographs on the subject. It is, in short, a case which became classic and is found fourteen years after to belong to the category of "such stuff as dreams are made of" and now offers ample excuse for reporting.

With the difficulty of deglutition, the patient notices that the boluses of food seem to lodge in the throat, and occasionally firmer portions of food appear in the mouth many hours after eat-

ing without any eructation or vomiting. This condition may continue for years, possibly undiagnosed, and, as happened in my own case, the patient told "not to bother, it was merely a nervous or hysterical manifestation." When the pouch is large, the food not only remains in it, producing fetid breath, but emaciation which may lead to starvation occurs, and ulceration or inflammatory disturbances exist in the pouch consequent upon the presence of decaying food. The duration of the symptoms may be of valuable aid in the differential diagnosis between cancer and diverticulum, but it must be borne in mind that a carcinoma may develop in the pouch.

In an article on the routine examination of the esophagus, Charles M. Cooper, of San Francisco ("American Journal of Medical Sciences," February, 1910, page 221) presents many valuable points. "Given a history of disturbance of deglutition, we must bear in mind the various conditions which may be causal factors, a diverticulum, a tumor from within or without, an aneurism, a cicatrix from swallowing a caustic, etc., hence the examination should be conducted in a routine manner and the esophagoscope used last of all. The history is carefully noted, the larynx examined for any cord paralysis or abnormality in position of the larynx, the throat massaged from below upward to see if the saliva which does not pass the constriction remains in the pharyngeal slit, and the patient is given fluid to swallow and later some bread. If in shaking the throat of a patient who has a diverticulum we can produce a succussion murmur, or if by giving the patient two or three bismuth capsules, they can be massaged from the lower part of the neck into the pharynx, a diverticulum may be discovered. The laryngeal picture may now have changed after deglutition and hence a second examination must be made. The pulse should be examined also, as the distended pouch may compress the deep vessels. The X-ray examination should now be made. This should be done antero-posteriorly. A mixture of two or three teaspoonfuls of equal parts of bismuth subcarbonate or chlorid and sugar of milk made into a paste with water is now given and a radiograph taken. If the pouch is below the level of the aortic arch, the patient is placed

in the right antero-oblique position. If a carcinoma be suspected, bismuth capsules are given and these may be readily seen lying above the growth." The writer, feeling that the retention of bismuth in the pouch my act as an irritant subsequently, as it is not so readily removed, used the following expedient: A soft rubber tube firmly tied was filled with shot and introduced, warm and oiled, gently to the point of constriction, and an excellent plate was the result, one which required no interpreter. If our examination shows an aneurism to be present, no esophageal tube should be inserted; if a cancer of the esophagus exists, the esophagoscope may be used and removal of such portion of the growth as may help to make the diagnosis clear. The sound, or bougie, should precede the esophagoscope, which should be the last method. The stomach should be empty, the dilated esophagus washed out, 1-4 grain morphia with 1-100 grain of atropia given a half hour previously, no sound passed for twenty-four hours, and the structures well anesthetized with 10 per cent solution of Beta-Eucaine in adrenalin and the examination made with the patient sitting or in the left lateral or dorsal position. Cooper uses the Einhorn instrument, watches its passage over the epiglottis and into the pharyngeal slit; the mandrin is then introduced and the instrument carried past the inferior constriction, when the mandrin is withdrawn and the passage of the instrument carefully watched.

H. S. Plummer (N. W., "Lancet," June 15, 1909) reports six cases of diverticula occurring in the practice of Dr. C. H. Mayo. For diagnosis he gives much credit to the method of using a silk thread as a guide as first proposed by Mixter.

Ballooning the esophagus should be mentioned when referring to diagnostic methods.

S. Kelen (New York "Medical Journal," February 23, 1907, page 345) introduces a sound with an airless bladder into the esophagus; this is distended until the patient feels the distention. By means of connecting tubes the exhaust air is measured.

H. P. Mosher ("Transactions of the American Laryngological Association," 1909, page 363) introduces an oval tube with trans-

parent plug; pressure on the bulb distends the pouch, whose walls thus stand out clearly.

The need of careful routine examination can not be too strongly emphasized, one method should follow the other in the manner above described, for undue haste and forcible methods might readily lead to disastrous results as in the case of aneurism, and by following this plan the patient becomes gradually trained to the method finally used.

Treatment: Where the diverticulun has not occasioned any symptoms beyond that of mild distress, we may content ourselves with occasional washing out of the diverticulum and care as to diet. Where, however, emaciation exists, the diagnosis having been firmly established, radical operation may be performed with success. DeWitt Stetten, New York City, has recently presented a monograph on the radical extirpation of pharyngo-esophageal pressure diverticula ("Annals of Surgery," March, 1910, page 301). Whether a previous gastronomy should be done or not must be decided for the individual case, but enough information is at hand to show that the operation for pharyngo-esophageal diverticulum is readily performed and reasonably safe. Stetten has collected statistics of sixty radically operated cases. Of these fifty were cured and ten died, a mortality of only 16.6 per cent. In Stetten's own case, that of a man aged sixty-five, the patient, who had a history of interference with deglutition of over two years' standing, was much emaciated, and cancer of the esophagus was diagnosed. Gastrostomy was performed. The patient did so very well after this operation, tubes at times entering the stomach, that the diagnosis of cancer was questioned and an X-ray examination was then made, using bismuth paste, and the obstruction shown to be diverticulum. This was successfully operated upon and the gastrostomy wound was allowed to heal.

These recent articles contain such full references to the literature of this subject that the writer deems it unnecessary to present them here.

The following case, mentioned in discussion of the symposium on diseases of the esophagus at the annual meeting of this asso-

ciation in 1909 is here recorded with its subsequent history: On April 1, 1909, a clergyman, aged fifty-six, consulted me because of a feeling of obstruction in his esophagus, which had existed for over three years. He could recall that a long time previous to that, upon bending over he could bring up grapes, swallowed hours previously, without any eructation or vomiting. More re-

Fig. 1.

Showing rubber tube filled with shot in esophagus.

cently he noticed that while there was no obstruction to part of his food, he found thorough mastication advisable, and from time to time would find food to appear in his mouth that he had ingested some hours before. There was no pain, no sense of

fulness, no vomiting and no emaciation. Slight hoarseness at times was always relieved by appropriate laryngeal treatment. An examination showed the right middle turbinate to be hypertrophied, mucus membrane of the larynx slightly engorged, cords functionating properly; liquid was readily swallowed. A large soft stomach tube was arrested eight inches from the mouth and as it was withdrawn a piece of bacon that had been swallowed four hours before was found in the mouth. An X-ray examination subsequently undertaken in the manner above described showed the obstruction to exist at the junction of the pharynx and esophagus (Fig. 1). A soft stomach tube passed the constriction easily, solid bougies were carefully passed and no blood followed, no discomfort and no vomiting. A diverticulum was diagnosed which was washed out; this was repeated a few times, but nothing further was done. A year has elapsed since this examination was first made and the patient reports that he is able to avoid trouble with his throat by constant care in keeping his diverticulum free from accumulations. He is very careful to evacuate this diverticulum upward after eating or drinking anything so as to alleviate the unpleasant sense of fulness in that locality. He can then go out and use his voice without distress or any unpleasant results. He has not been compelled to cease from his usual vocation at any time during this year. Unless other symptoms arise, further interference is not deemed advisable.

From a consideration of this subject the writer presents the following conclusions:

1. The examinations should be conducted in a routine manner, the esophagoscope being used last, bearing in mind always the danger of a rupture of a possible aneurism.

2. In making the examination with the X-ray, the introduction of a soft tube filled with shot may take the place of bismuth.

3. Esophageal diverticula may be readily diagnosed.

It may be of interest before presenting the final conclusion of the present day treatment of diverticula to quote briefly from that model text book of Von Ziemssen ("Disease of the Esophagus," page 51, American edition, 1878). "The radical cure of

diverticula by operative procedure from without is at present one of our vain wishes; yet we should hope that even this operation conducted on Lister's plan might at some future day be performed without danger."

It is therefore with the greatest possible gratification that we can now say that that wish is fully realized and gladly present the final conclusion:

4. Modern surgery offers much hope for these patients.

Discussion.

Dr. Chevalier Jackson: I think we all agree with Dr. Mayer's conclusions, excepting the first, and it is only his modesty which leads him to put the esophagoscope last. If it were a question of disease of my own esophagus I would rather, as the first procedure, have Dr. Mayer pass the esophagoscope down gently and see what he is doing than to have the bougie passed by any one blindly. We do not know what the end of the bougie is doing or where it is going, and bouginage seems to me a much more dangerous procedure than a skillful esophagoscopy, such as Dr. Mayer does.

Dr. J. Gordon Wilson: I would like to show a very unique case of pharyngeal diverticulum which occurred in a young lion twenty months of age. The cause of death was pressure on the respiratory passage due to the accumulation of large pieces of meat in the pouch. You will observe that this diverticulum occurs in the lower part of the pharynx opposite the cricoid cartilage. It corresponds in position to the so-called high esophageal diverticula of man. The interesting points in this specimen are:

(1) A distinct macroscopic thickening in the submucous tissue at the pharyngo-esophageal junction in the location of the esophageal sphincter, to which attention has been drawn by Killian and by myself, and more recently by Keith.

(2) The presence of a large diverticulum in a young animal in which no atrophic changes are present in the pharyngeal walls, a point of importance in regard to the origin of these so-called esophageal sacs.

Dr. Mayer: Replying to the question asked by Dr. Jackson in regard to using the esophagoscope first, I feel that if any one of my patients were to go to Dr. Jackson or to Dr. Mosher I would say, examine them any way you like; but we are writing for men not with special skill, and we should send out a note

of warning and call attention to the harm that may be done even by the bronchoscope. I am sure that those who have used these instruments and have seen others use them will agree with me that much harm can be done by using instruments which are perfectly safe in trained hands, and therefore one should call attention to the method of making examinations. It is rather remarkable that after having told the Secretary that I would give a resume of this subject before the association, that within the last two months there have appeared three various articles on the subject in the journals of the United States. Cooper himself states that many of these cases come first to the laryngologist, and that it seemed natural and proper that they should do so. Is it not right to call attention to a graded method of examination? I do not mean that men should use a bougie and poke it in there. I think if he finds an obstruction he should desist. Ordinarily, I would agree with Dr. Jackson that one should try what he can see first, but in a case of this kind, where there is a possibility of injury, the rupturing of an aneurism, one should satisfy himself of the absence of any serious condition. That is the reason that, speaking generally, I feel that one should advise a routine method of examination.

JOINT SESSION.

On the afternoon of Wednesday, May 4, there was a joint session of the American Climatological Society, represented by Drs. J. A. Miller, of New York City, and H. M. King, of Liberty, N. Y.; the American Otological Society, represented by Drs. H. C. Reik, of Baltimore, Md., and B. A. Randall, of Philadelphia, Pa., and the American Laryngological Association represented by Drs. H. S. Birkett, Montreal, Canada; C. G. Coakley, New York City, and F. C. Cobb, Boston, Mass. The general topic was "Vaccine Therapy." The papers read by Fellows of this association herewith follow:

FIRST PAPER.

THE VALUE OF VACCINE TREATMENT OF CHRONIC INFLAMMATORY DISEASE OF THE ACCESSORY SINUSES OF THE NOSE.

BY HERBERT S. BIRKETT, M.D. AND J. C. MEAKINS, M.D.

It is a common experience that, following an attack of certain infectious diseases, there remains a resistance to a subsequent attack. This had been recognized by physicians from the earliest times, but Jenner was the first to make practical application of this principle in the vaccination for smallpox; by passing the virus of smallpox through the cow the virulence of the virus is diminished; thus, when vaccination with this virus is performed, a mild attack of the disease results. The re-establishment by Koch and Pasteur of the specific bacterial causes of infectious diseases stimulated the latter to attempt further protective vaccinations against anthrax in sheep, chicken cholera and swine plague.

The general application of this protective principle of vaccination in man is beyond consideration, as, to protect against

all infectious diseases, a different vaccine would have to be used for each disease, and the resistance at the best is of a few months' duration; but in two epidemic diseases of common occurrence, namely, typhoid fever and cholera, brilliant results have been obtained.

If we could always determine the time of infection, and if the incubation period were long enough, much could be done to prepare the human organism before the disease sets in, and thus avert the severe attack. Pasteur recognized this in hydrophobia, and, although he failed to find the actual virus of rabies, he recognized that the cause of the disease was situated in the central nervous system. Thus, assuming that the spinal cord and brain of an animal dead of rabies contained in a pure state the virus of this disease, he subjected these parts to a process by which the virus would be attenuated. Making an emulsion of these parts, he innoculated an infected individual during the long incubation period with small daily vaccinations, increasing the amount each day, and produced an immunity before the disease actually began. From this has developed the Pasteur or vaccination treatment of rabies as we know it to-day.

In order to have a clear conception of what causes the resistance to a disease after the first attack, or through vaccination, a certain knowledge of the processes of immunity is necessary. There have developed during the past thirty years two views of immunity, "the cellular" and "the humoral." The cellular view has been maintained by Metchnikoff and his followers, who claim that the main power of the body to resist disease is due to the phagocytic cells, which engulf the organisms and kill them. The second or humoral view has been chiefly championed by Ehrlich, who has held that the phagocytic cells play but a secondary role, and that the main defensive power of the body lies in the bacteriocidal and bacteriolytic powers of the blood plasma, which increase during the processes of recovery or immunization and thus produce a cure or protection, as the case may be.

That these two views were not irreconcilable was suggested by Denys and Leclef, who showed that blood serum was necessary for the ingestion of bacteria by the leucocytes. Later,

Wright proved beyond all doubt that the blood plasma contained a substance which must first act upon the bacteria before the leucocytes could ingest them; he called this substance "opsonin." Therefore we have a definite connection between the two views of immunity. Following the publications of Wright and his followers, the role played by opsonins was very much emphasized and in many cases exaggerated. That opsonins play a great role in immunity there can be no doubt, but there is no proof that they are the chief factor in the protection from or the cure of infectious diseases.

It has been repeatedly demonstrated that the injection of either living or dead organisms into an animal, whether human or otherwise, causes the production of bacteriolysins, agglutinins, precipitins and opsonins, or when toxins, as those of tetanus and diphtheria, are injected, anti-toxins are formed. Thus it must be realized that when vaccines are administered, not only are opsonins produced, but also bacteriolysins, agglutinins, etc. It is true that the protective bodies do not always develop in the same proportion, as some bacteria seem to stimulate the production of bacteriolysins more than opsonins, while other bacteria may act in an opposite manner.

Although the vaccination of a healthy animal causes an increase of the protective substances, which furnish a certain degree of immunity, yet, would vaccination be advantageous, or even applicable, in a person already the subject of an infective process? As I (J. C. M.) have already pointed out, if one could but know when the infection occurs, and if the incubation period were long enough, much could be done to prepare the human organism before the infection fully develops, as is done with rabies. But this is quite impossible with many diseases. There are, however, some infections which are imminently suited for vaccine treatment, namely, chronic localized infections.

Although protective bodies are present in all the fluids of the body, especially the blood plasma and lymph, there is no proof that they are formed there. In fact, there is almost conclusive evidence that they are not formed in these tissues, but most likely by the fixed cells of the body. When a localized

infection occurs, the tissues immediately surrounding the diseased area are the only ones directly affected by the invading organism, and these are in a damaged condition. They are exerting all their powers to prevent the spread of the disease, and thus the healthy tissues of the rest of the body are very little stimulated to form protective substances. However, when bacteria are injected into a healthy subcutaneous tissue the virus is quickly absorbed and distributed to all the healthy tissues of the body. These tissues are thus stimulated to form protective substances, which circulate in the blood stream.

The effect of the vaccination on the local infection is to temporarily increase the vascularity of the lesion, and a local leucocytosis occurs. In this manner more serum is present, which is soon very rich in protective substances, and the bacteria are more quickly dissolved by the bacteriolysins, and the opsonins prepare the organisms for ingestion by the leucocytes. Each subsequent vaccination tends to increase the protective bodies, until eventually the body has acquired a degree of immunity sufficient to overcome the localized infection. However, there is an important point to be accomplished to further this process, that is, the obtaining of good drainage, so that the cavity will not act as a human culture tube. This is most important in the infections in which we are interested to-day, namely: Chronic inflammatory diseases of the accessory sinuses of the nose.

It will be well to first review in brief the anatomy and pathology of these regions, so as to better appreciate the difficulties to be overcome in effecting a cure.

The Antrum of Highmore, so far as its surgery is concerned, is practically a closed cavity, having but one orifice, the ostium maxillare, which is situated near the top of cavity. On this account drainage is very imperfect. The ostium of the frontal sinus is, fortunately, situated at its most dependent point—the outlet of the ethmoidal cells is also fairly well located, but the ostium-sphenoidal is only a few millimetres below the roof of the cavity. Besides the poor situation of the outlets of these sinuses, one or more may be completely obstructed by swelling of the mucous membrane, due to inflammation.

The mucous membrane of these sinuses has normally the

power of absorbing a moderate amount of exudate, and in the acute stage of any inflammatory process this power plays a large role in the recovery of the lesion. When, however, the mucous membrane becomes oedamatous and infiltrated, and finally thickened with fibrous tissue, the power of reabsorbing exudate is lost, and the retention of exudate in the sinuses is accentuated on account of the narrowing of the various ostia, due to swelling of the mucous membrane.

There is also another point to be considered in the pathology of chronic sinusitis. In a large percentage of cases the mucous membrane seems to acquire a habit of excessive secretion. By this I (J. C. M.) mean the permanent hypersecretion of mucous by a membrane that has become permanently changed through a chronic inflammatory process. It is not necessary that it be greatly changed in structure, but by continually repeated stimuli the habit of hypersecretion has become established, and is really the physiological function of the changed mucous membrane, as is seen in leucorrheoa, due to chronic non-infected endometritis and endocervicitis.

Naturally, an accurate knowledge of the bacteriology of any infectious process is necessary before vaccine treatment may be begun, as it is always important to use a vaccine made of the infecting organism from the diseased area. In short, homologous, vaccines give better results than do heterologous vaccines.

The bacteriology of the inflammatory diseases of the accessory sinuses varies considerably. As a rule, such diseases are secondary to acute infections of the nose and nasopharynx. The chief organisms causing acute rhinitis and naso-pharyngitis are the bacillus of Friedländer and members of this group, bacillus septis and the micrococcus catarrhalis. Naturally, in the acute stages of sinus inflammation these organisms are also the chief exciting causes, but when the disease becomes more chronic, staphylococcus aureus is the most common invader and less frequently streptococcus pyogenes and the pneumococcus. I (J. C. M.) have designated these organisms "invaders" and not causative agents, which will be explainted later. Thus we may say that the chief bacteria found in chronic dis-

eases of the accessory sinuses are the pyogenic cocci. It has been repeatedly demonstrated, both in human and laboratory animals, that vaccination with these organisms will produce a distinct immunity.

The symptoms which indicate treatment in these cases are not those of suppuration of sepsis, but those of excessive or retained secretion. There is no fever nor general systemic reaction. There is no erosion or loss of substance, but, on the contrary, a thickening and heaping up of the mucous membrane. There is continued and excessive secretion of mucoid or muco-purulent fluid, which is very annoying to the patient, and if the outlet or outlets become temporarily closed, the symptoms of fluid under pressure ensue. The importance of these facts on the treatment of chronic inflammations of the accessory sinuses will be demonstrated later.

Thus, although the mechanical difficulties are great, owing to the local character of the lesion, yet, from the standpoint of immunity, some relief might be expected from the vaccine treatment if infection were the chief cause of the symptoms.

The earliest practical application of vaccine therapy to the cure of certain acute and chronic forms of diseases of the nose is found in a paper by R. W. Allen, three years ago, but as the subject under consideration is that concerning the chronic form of infection, we will pass over the results obtained in the acute stage to those of the chronic, in which the frontal, ethmoidal and antral sinuses were involved. At the outset this author admits that the results are less satisfactory in the chronic diseases of these areas. Unfortunately, no statistics are given, thus practically eliminating the value of the results obtained by this method of treatment. The author, however, maintains that the treatment prevented the outburst of acute attacks through raising the opsonic index.

Following this paper, we find two more appearing, in 1908 and 1909, one by Butler Harris and the other by Schorr, in which each author states the probability of being able to accomplish satisfactory results with vaccine therapy in certain forms of chronic inflammation of the nasal organ without, however, being specific in their statements.

The first systematic attempt to test the value of vaccine therapy in chronic suppurative diseases of the accessory sinuses of the nose appears in an article by Beck, in which he applied this form of treatment to four cases of chronic suppuration, two of which involved one frontal sinus, one of pansinusitis and one of antral involvement. This author states that, without exception, a distinct improvement was noted, and some cases were cured, although not enough time had elapsed to be absolutely certain.

Levy, in March, 1909, reports fifteen cases of accessory trouble of a chronic nature, classified as follows:

Antrum of Highmore	5
Frontal Sinus	5
Frontal Sinus and Antrum	3
All Sinuses	1
Antrum and Ethmoid	1

Results obtained were: Six cured, six improved and three not improved. All of the cases were chronic in their nature, and had received prolonged and faithful treatment by drainage and irrigation. Many of them had been operated upon as often as three times, the operation being usually conservative in character. The author concludes with the following statement: "That all obstinate cases in which conservative methods, including so-called 'Conservative Operations,' have been adopted, should receive the benefit of vaccine."

Upon the gratifying results obtained by these authors, we were stimulated to test the value of this treatment, especially in two cases of chronic suppurative ethmoiditis, which had not resolved under most energetic operative measures. With this object in view, the following cases were treated with homologous vaccines:

Case 1. Mrs. A., age 32, telegraph operator.

Diagnosis: Chronic bilateral pan-sinusitis of 7 years' duration.

Etiology: Following an attack of acute influenza.

Bacteriology: Culture, pure growth of staphylococcus aureus.

Smears of the discharge show mucus, many pus cells and cocci in clumps (Staphylococcus).

A vaccine was prepared from the patient's own staphylococcus, and the first injection of one hundred millions was given on January 22d, 1910. The second injection of two hundred millions was administered on January 28th, and the third on February 5th, 1910. The patient then passed from personal observation, but the vaccination was continued every week until April 20th, 1910. During the first six weeks there was a distinct improvement in the condition. The discharge was less abundant and not so purulent. Smears of the discharge taken on February 10th, 1910, showed much mucus, a few pus cells and extremely few cocci. The present condition of the patient, however, shows very little further improvement. There is still considerable mucoid discharge and headaches persist, evidently due to the retention of secretion.

Case 2. J. J., age 36, laborer.

Diagnosis: Chronic bilateral frontal sinusitis of 10 years' duration.

Etiology: Following acute rhinitis.

Bacteriology: Culture pure growth of streptococcus pyogenes.

Smears of the discharge show much mucus and also a large number of pus cells and cocci in short chains.

A vaccine was prepared from the patient's own organism, and the first injection of fifty millions was given on January 3d, 1910. The vaccinations were repeated every seven days, gradually increasing the dose until five hundred millions streptococci were given, and at no time were any ill effects noted. In all, fourteen vaccinations were given. The result in this case was a slight improvement. The character of the fluid changed from a muco-purulent to a purely mucoid fluid. On April 2d cultures were taken from the discharge, but were sterile. On April 4th a similar result was obtained, but on April 6th a growth was obtained, although there were only two colonies on a large blood agar slant. Smears taken at these times showed very few pus cells and no streptococci.

The discharge, however, has continued, with all the distressing symptoms of hypersecretion and retention.

Case 3 (with kind permission of Dr. W. H. Jamieson). J. B., age 23; occupation, maid.

Diagnosis: Chronic ethmoiditis and sphenoidal sinusitis; duration 7 years.

Etiology: Following acute rhinitis.

Bacteriology: Cultures. A pure growth of staphylococcus aureus.

Smears of the discharge reveal a fluid containing many pus cells and cocci in clumps (staphylococcus). A vaccine was prepared from this staphylococcus, and the first vaccination was given on January 24th, 1910. This was repeated every seven days until April 21st, 1910. On February 16th a radical Killian's operation was done, but the cells appeared in fairly good condition. A microscopical examination of the mucous membrane shows a layer of fibrous tissue of a rather hyaline appearance, covered by columnar ciliated epithelium and containing in places a group of mucous glands.

On April 3d, 1910, a culture was taken from the discharge in order to make a fresh vaccine. Three cultures had to be taken before a growth was obtained. Smears taken at these times showed a moderate number of pus cells, but no organisms.

Although the character of the fluid has changed from a muco-purulent condition to one of almost a pure mucus, yet the quantity is about the same and the symptoms remain, being those of hypersecretion and retention.

Case 4. Mrs. E., age 45, housemaid.

Diagnosis: Chronic unilateral (left) frontal sinusitis of seven years' duration.

Etiology: Following acute rhinitis.

Bacteriology: Cultures were taken five times before a very scanty growth of staphylococcus aureus was obtained.

Smears taken at these times showed a muco-purulent fluid containing a moderate number of pus cells, but no bacteria.

A vaccine was prepared from the patient's organism, and the first vaccination of one hundred millions staphylococci was given on March 2d, 1910. This was repeated every seven days, the dose being gradually increased until five hundred million cocci in one injection were given. In all, the patient was vaccinated eight times, and no untoward reaction was observed.

Smears taken from the discharge six weeks after the vaccine treatment was commenced showed a few pus cells, but no bacteria. There has been slight, if any, improvement in the patient's symptoms.

A critical view of these cases makes one doubt the importance of bacterial infection in the perpetuation of these lesions. In cases one, two and three, a growth was readily obtained before the vaccine treatment was instituted. In case four, however, the repeated negative results were very significant of the lack of bacterial infection. After treatment by homologous vaccines a certain improvement occurred, but this was not so much in the quantity of the exudate as in its character. The smears revealed a practically pure mucoid condition of the discharge and the absence of organisms was very striking. In addition to this, the repeatedly negative results of cultures in all the cases afford strong presumptive proof that the bacteria had been destroyed by the vaccine treatment. But, in spite of this, the discharge remains and the symptoms are practically all due to this continued secretion and partial retention. The explanations of this hypersecretion can be accounted for, it seems to me (J. C. M.) by three facts: Firstly, the sub-mucous layer of the lining of these cavities has become chronically thickened and thus the reabsorbative power has been lost; secondly, the ostium has become partially closed, due to the swollen mucous membrane and thus drainage is defective, and thirdly, due to repeated stimuli, most likely bacterial at first, the mucous membrane has acquired the habit of hypersecretion. This hypersecretion is most likely started by bacterial action, but after a time it becomes a true habit, independent of bacteria as is evidenced by its perpetuation after the cavity has been practically sterilized.

In the vaccine treatment of acute inflammation of the accessory sinuses of the nose I (J. C. M.) have had no experience. The results of others have been very successful, but the majority of such cases recover without treatment, and it will require a large series of cases to determine whether the incidence of chronic inflammatory disease is reduced by vaccine treatment or not.

There is a class of cases, however, for which vaccine therapy

is particularly indicated. These are what may be called the subacute cases. By this I (J. C. M.) mean those cases following acute sinusitis which give indication of becoming chronic. In such cases, the use of vaccines would most likely sterilize the cavities and thus remove the exciting cause before the chronic changes have occurred.

Conclusions (J. C. M.).

1. Vaccine treatment will sterilize the accessory sinuses of the nose when the subject of chronic disease.
2. The chronic discharge of mucus from the accessory sinuses of the nose is not so much due to bacterial infection as to habit hypersecretion.
3. The symptoms are not due to infection, but to hypersecretion and retention.
4. Although vaccine therapy is a valuable adjunct to treatment, the establishment of free drainage by the removal of polypoid masses and redundant mucous membrane is more important.
5. The cases of sinusitis showing a tendency to become chronic should be treated early by homologous vaccines.

Bibliography.

1. La Cellule, 1895, XI., 175.
2. Proceedings of the Royal Society, 1903, LXXII.
3. Hektoen, Journal of Inf. Diseases, 1910.
4. Lewis & Turner, Edinburgh Medical Journal, November, 1905.
5. R. W. Allen, The Opsonic Method of Treatment, Philadelphia, 1907.
6. Butler Harris, Treatment by Bacterial Vaccine, The Practitioner, May, 1908.
7. J. Beck, Vaccine Therapy in Suppuration of Nose and Ear, The Laryngoscope, May, 1908.
8. B. Levy, Vaccine Therapy in Otology and Rhino-laryngology, Annals of Otology, Rhinology and Laryngology, March, 1909.
9. W. T. Sewell, The Lancet, December 11th, 1909, p. 1747.

SECOND PAPER.

EXPERIENCES IN THE USE OF VACCINES IN CHRONIC SUPPURATION OF THE NASAL ACCESSORY SINUSES.

By Cornelius G. Coakley, M.D., and A. I. Kendall, Ph.D.

In January, 1907, I made a study of the Opsonic Index, and employed vaccines in the treatment of chronic inflammation of the nasal accessory sinuses.

The bacteriological examinations and manufacture of the vaccines were done by A. I. Kendall, Ph.D., who was very highly recommended to me by Doctor William H. Park.

We chose chronic cases in preference to acute ones, because in the latter many cases get well so promptly with any type of treatment that we felt it was impossible to draw satisfactory conclusions from the employment of vaccines in the treatment of acute cases.

Doctor Kendall's report to me of his portion of the work is as follows:

"This work was undertaken to develop, if possible, a method of clinical diagnosis and curative treatment for chronic inflammatory processes in the accessory nasal cavities of patients upon whom it was inexpedient for various reasons to operate.

"The aim throughout this work has been to do the work in the most practical manner, paying due attention in every step to insure scientific accuracy, but striving at the same time to eliminate unnecessary procedures in certain instances and to reduce the remainder of the process to its lowest terms compatible with definiteness and accuracy of results.

"The clinical and bacteriological findings comprise two closely related but perfectly distinct entities, and they will be so treated in this work.

Bacteriological Technic.

"The bacteriology of the nasal sinuses is not at all well known, although a considerable amount of work has been done upon the subject. The most accurate and complete investigation along these lines is that of A. Logan Turner. The most important point, judging from his work and that of others, is the determination of the organism or organisms causing the specific lesion, as distinguished from secondary invaders, which are usually present in the mucous secretion and pus which ordinarily fills the diseased sinus.

"In order to eliminate as far as possible the latter, and to facilitate the determination of the former, the affected sinus was first carefully washed out with sterile saline solution; then the freshly exposed membrane was lightly but firmly touched with a sterile applicator, whose infected surface was then rubbed gently upon the surface of sterile blood agar plates. The plates were incubated at 37 degrees for twenty-four hours or longer, depending upon conditions, which were somewhat variable. Colonies of the various organisms were removed for examination, pure cultures obtained by twice replating the particular bacteria desired, and finally the cultures were identified upon the various customary media, and then were ready for use.

"The method of determining the Opsonic Index, according to Wright's scheme, is well known, and as his procedure was exactly followed, it is not necessary to repeat it here.

"As a control, smears were made from scrapings of the diseased membrane in every case, stained and the morphology and staining characters compared with those of the bacteria isolated on the plate culture. This gave much valuable information in many instances, particularly when two or more organisms appeared upon the plates, allowing one to judge in some instances which was the organism concerned in the pathological condition.

"A few points deserve special mention:

"1. The organism or organisms used in determining the Opsonic Index, and for vaccine were derived in every instance from the patient himself, the idea being to vaccinate with the specific strain causing the trouble; it is probable that in many instances

other cultures of the same species would have answered quite as well, but this point is not settled, as yet, and the light extra trouble was not a serious drawback in this work.

"2. The control, or normal serum was obtained from two or three normal individuals, carefully mixed in equal proportions, and employed in this form to eliminate as far as possible individual variations.

"3. The leucocytes were obtained from normal persons.

"4. In counting the number of bacteria taken up by leucocytes, no allowance was made when white cells contained an abnormally high number, or when no bacteria appeared in their protoplasm; if, however, leucocytes were clumped in any portion of the field, no counts were made in that particular place.

"5. Each determination of the Opsonic Index was made in duplicate; equal volumes of serum, leucocytes and bacteria were placed in each of two tubes, exposed to the same temperature for the same length of time, in such manner that the conditions were as far as possible the same in each case. Counts were made of one hundred leucocytes for each slide. The scheme of enumerating fifty white cells on each of two sides of every slide was adopted as the most satisfactory and accurate.

"6. In virtue of the fact that many counts had to be made, the plan of taking a sample of blood the day of vaccination followed by another sample twenty-four hours after was adopted. By so doing, each patient was examined about once a week, while the indices show the immediate as well as the mediate results of the injections.

7. The Opsonic Index was not used as a criterion for further treatment—it was found that the observed results had no apparent relation to the physical condition of the patient in many instances.

In most instances one bacterium predominated, or occurred in pure culture upon the diseased membrane when the sinus was cleaned as indicated above. In a few cases (see Table 1), two or more organisms occurred either in the same or in alternate cavities. In the latter event, equal numbers of each organism were injected. A further complication occurred in a few individuals:

the species present at the start of the investigation was replaced by another organism, under such conditions the new bacterium was used in subsequent vaccinations.

Vaccines were made up to contain from 1,000,000 to 4,000,000 bacteria per cubic centimetre, the amount of each injection. The amount injected varied with the physical condition of the patient, as well as with the number of vaccinations.

The requisite number of organisms were suspended in physiological saline solution, killed by thirty minutes' exposure to 60 degrees C. preserved with 0.5 per cent carbolic acid, and, if shown to be sterile by suitable cultural tests, used after three days.

The bacterial species found in diseased nasal cavities were the following: Micrococcus aureus and albus (staphylococcus pyogenes aureus and albus), streptococcus pyogenes and bacillus capsulatus (bacillus mucosus capsulatus). These organisms were identified upon the usual culture media, capsules stained by Welch's method, and their final specific names given when the characteristics agreed with standard published descriptions. In three instances an organism was found which grew with extreme difficulty upon any medium; it was impossible to obtain sufficient growth for vaccination purposes and these bacteria had to be abandoned. It should be stated that in these cases the smears showed only a few of this species of bacterium, and that other organisms capable of accounting fully for the phenomena were present.

Even with the streptococcus cultures, the first two or three transfers grew poorly; this was probably due to the fact that the organisms had been strict parasites for some time, and that the change to artificial media was a great change for them. After a time, however, such cultures grew normally and without further trouble.

The fact that relatively pure cultures persisted after the sinuses were flushed out simplified greatly this work; judging from the results, the chances are that these bacteria were the ones intimately concerned with the process in which they were found. Case No. 9 showed a very interesting condition; the right an-

trum contained an absolutely pure culture of *Bacillus Capsulatus,* while the right ethmoid showed only *Streptococcus Pyogenes.*

Table No. 2 shows the dates of vaccination, the opsonic indices as they were determined from time to time, and, together with Table No. 1, gives a complete bacterial history of the patients.

A perusal of the tables will show at once that it is quite impossible to draw any definite conclusions from the work as far as it has been possible to carry it; the results are indefinite from all points of view, although it should be mentioned that they are in accordance with the experience of other observers along similar lines.

To Summarize the Bacterial Results.

1. The bacterial flora consisted of the following organisms: Streptococcus pyogenes, micrococcus albus and aureus mucosus capsulatus.
2. The Opsonic Index has been unsuitable either as a means of clinical diagnosis or as a criterion for further treatment.
3. The vaccinations, made up in varying strengths, have not been followed by those changes in the Opsonic Index which would be expected, were this method of treatment one upon which one could rely in practical work.
4. The amount of time necesssary to carry out fully a careful opsonic treatment is not beyond that which the ordinary practitioner could afford to spend, but is, with the present technique and status of the subject, quite out of proportion to the value of the information which one might derive from such a procedure.

The therapeutic result of the inoculation of lthese severa cases, so far as I can judge, were absolutely valueless.

Before the use of the vaccines, these chronic cases frequently had periods of improvement of the symptoms, and other periods when symptoms were aggravated.

In a few of the cases some improvement was noticed after the first or second injection, but later the discharge and other

symptoms recurred, as they had done in other methods of treatment.

In no case did I feel that there was any permanent benefit derived or harm done by this treatment.

Table 1.

Sinuses involved; organisms isolated from the various cases; the dates of isolation, and dates of appearance of new organisms.

Case 1. Suppuration, left sphenoid—January 10th, streptococcus pyogenes in smears; staphylococcus pyogenes aureus in cultures.*

Case 2. Suppuration, right posterior ethmoid—January 9th, streptococcus pyogenes.

Case 3. Suppuration, left sphenoid, right frontal—January 9th, streptococcus pyogenes; February 15th, streptococcus disappeared, staphylococcus pyogenes aureus appeared and persisted.

Case 4. Suppuration, left frontal, left antrum, left tympanic cavity—January 10th, streptococcus pyogenes; March 7th, replaced by staphylococcus albus.

Case 5. Suppuration, left antrum—January 11th, staphylococcus pyogenes aureus.

Case 6. Suppuration, right antrum—January 11th, staphylococcus pyogenes aureus.

Case 7. Suppuration, right antrum—January 18th, bacillus mucosus capsulatus. A few aureus colonies were present, but disappeared within two weeks.

Case 8. Suppuration, right frontal—Sterile.

Case 9. Suppuration, right frontal, right antrum—January 10th, bacillus mucosus capsulatus and streptococcus pyogenes.†

---

*The streptococcus lesion cleared up at once, and this organism never appeared in culture after this date. The organisms were found in small number in smears, but could not be isolated.

†The streptococcus lesion cleared up at once, and this organism never reappeared in the antrum, while later the streptococcus appeared in pure culture in the right ethmoidal sinus.

Case 10. Pansinusitis—February 1st, bacillus mucosus capsulatus.

Case 11. Suppuration, left antrum—February 1st, streptococcus pyogenes.

Case 12. Suppuration, right frontal, right antrum—February 2nd, bacillus mucosus capsulatus.

Case 13. Suppuration, right antrum—February 6th, staphylococcus aureus.

Table 2.

Showing the dates of vaccination and samples of blood for opsonic indices, the amounts (in millions of bacteria) of vaccine and the opsonic indices for the various cases.

Case 1.		Case 2.		Case 3.		Case 4.	
Jan. 13	0.84	Feb. 4	0.57	Jan. 19	1.09	Jan. 19	0.87
	1.35		200	Jan. 26	0.99	Jan. 26	0.61
Jan. 25	100	Feb. 5	0.62	Jan. 28	150	Jan. 29	100
	1.43	Feb. 15	1.16	Jan. 29	1.0	Feb. 6	0.76
Jan. 26	1.51	Feb. 20	0.85	Feb. 6	0.84	Feb. 13	1.36
	1.29		0.86	Feb. 13	200	Feb. 17	100
Feb. 1	100		200		0.70	Feb. 18	1.23
	1.00	Feb. 21	0.73	Feb. 15	0.71	Mar. 1	0.96
Feb. 2	0.82	Feb. 27	0.74		0.94		200
Feb. 6	200	Mar. 6	200	Feb. 28	1.28	Mar. 2	0.86
Feb. 7	0.59		0.96		200	Mar. 15	0.50
	0.56	Mar. 7	0.95	Mar. 1	0.64	Mar. 16	2.12
		Mar. 15	1.01	Mar. 8	1.08		
		Mar. 21	0.70		200		
			250	Mar. 14	0.63		
				Mar. 20	0.66		
					250		
				Mar. 21	0.80		

Case 5.		Case 6.	
Jan. 19	0.84	Feb. 5	0.86
Jan. 30	0.99		200
	100	Feb. 6	0.77
Jan. 31	0.67	Feb. 15	0.58
Feb. 6	0.81		0.59
			200
		Feb. 16	0.67
			0.70

Case 7.		Case 10.	
Feb. 21	1.13	Feb. 20	0.87
	200		200
Feb. 28	0.93	Feb. 21	1.50
	200	Feb. 26	0.98
Mar. 1	0.58		200
Mar. 7	1.07	Feb. 27	0.92
Mar. 14	1.30	Mar. 14	2.35
Mar. 15	0.80		200
Mar. 21	1.50	Mar. 15	1.44
	200		

Case 11.		Case 12.	
Mar. 1	0.96	Feb. 28	1.22
	200		200
Mar. 2	1.14	Mar. 1	0.74
Mar. 15	0.78	Mar. 7	0.91
	200	Mar. 14	0.39
Mar. 16	1.30	Mar. 15	0.74

THIRD PAPER.

EXPERIENCE WITH THE USE OF VACCINES IN DISEASES OF THE NOSE AND THROAT.

BY FREDERIC C. COBB, M.D., AND E. W. NAGEL, M.D.

The question of Vaccine Therapy, as applied to diseases of the nose and throat, is a most complicated one. It would seem at first sight as if conditions so far as partially closed cavities draining through narrow openings into the nose are concerned, should not differ from similar conditions in aural abscess.

Yet, in long-standing suppurations of the middle ear, I have seen pus dry up and perforations of years standing heal, and the improvement persist for months.

Under the same bacteriologist, however, and with the same technique, abscesses of the accessory sinuses of the nose have failed to yield the same brilliant results.

At the Massachusetts General Hospital a series of twelve cases of atrophic rhinitis was begun in January of this year, and continued from February until May at the Boston Dispensary. After thorough disinfection of the vestibule of the nose by the methods advocated in the transactions of the American Laryngological Association in 1909 by Dr. Nagle and myself, a bacillus of which we could find no description was obtained in pure culture in all cases. From this bacillus a vaccine was made, and injections varying in amount from one hundred and fifty million to five hundred million bacteria were given at intervals of three days. A very general improvement in odor, amount of crusts and discharge has resulted, and yet, in no instance, can an absolute cure be claimed. We have tried to look at these cases impartially, and Dr. Nagel, who has carried on the work, has submitted them without comment to me for periodical examinations. Before beginning vaccine treatment, these patients were in the habit of using nasal washes, and this treat-

ment has not been changed while carrying on the injections, except that before the periodical observations they are not allowed to use a douche for twelve hours. All these patients are quite sure of the relief to their symptoms afforded by the vaccine, and are faithful and enthusiastic in following out the treatment.

Objectively, it has been found most difficult in describing the amount and appearance of the crusts to be absolutely without bias and accurate in our judgment of the results.

It certainly has seemed as if the crusts were smaller, thinner, and less hard and dry than before, and this observation corresponded to the subjective sensations of the patients.

One indication that the effect was not purely mental is shown by the following observation:

The supply of autogenous vaccine having given out, a staphylococcus vaccine was used for two or three injections, and nothing was said to the patients of the change which had been made. To our surprise, they all stated that for some reason they were not improving as they had been before, although we could see no difference in the nasal condition. In some of the patients the effect on the general health seems to have been very good, and we were unable to observe any injurious effects which could be traced to the injections. When it is considered that atrophic rhinitis is a disease of many years' duration, that the results should be unsatisfactory as regards cure is natural, and we feel that any improvement should be a cause for satisfaction. Four cases of sinusitis treated by Dr. Kerr at Dr. Coolidge's clinic at the Massachusetts General Hospital, of which she has kindly given me notes, have resulted as follows: Case I. Male, age 43, operated on for polypi, and later, by radical operation on the antrum, was treated for a month with streptococcus, with marked improvement. Injections continued until January 1, 1910, when they were stopped for three weeks. Since this time there have been more discharge and headaches, but cultures frequently taken from the antrum have shown no growth. The case is still under treatment. Case II. Male, age 38—Antral empyaema staphyloccus aureus; discharge from left antrum ceased after eight treatments; amount from right antrum

decreased. Case III. Male, age 15—Purulent discharge one year; culture shows streptococci and a small bacillus, thought to be influenza; fourteen injections of streptococcus vaccine were given without marked improvement. Case IV. Female, age 18—In this case streptococcus, staphylococcus and autogenous vaccine were used without improvement, the patient finally being operated on with the Killian method by Dr. Mosher. The frontal sinus, ethnoid and antrum all showed extensive disease.

Three cases were treated last winter by Dr. Nagel and myself.

In Case I, an old frontal sinus and antrum, operated on several times some years ago, injections of streptococcus and staphylococcus vaccine were used during the winter of 1909 with varying results.

The patient was away during the summer, and no vaccines were given during the early part of the winter. Discharge still persists, but the patient feels better and more free from pain, and, truly or falsely, attributes this result to the vaccine. Case II—After thirty-two injections of antogenous staphylococcus for a frontal empyaema, has less attacks of pain and dizziness; decreased discharge and general improvement. Case III—Frontal sinus; has had twenty staphylococcus injections. Duration of discharge, two years; pressure symptoms relieved; dullness and heavy feeling in the head improved and secretion almost stopped. To summarize briefly: In some cases there has been some improvement, but in no case cure. In atrophic rhinitis, improvement in amount of crusts; disappearance of odor; but in no case absolute cure.

General Discussion.

The discussion was participated in by members of the different societies. That portion pertinent to the field of rhinology and laryngology was as follows:

Dr. J. Solis Cohen: I have had a very prolonged experience with tuberculin. For thirty years I was consulting physician in a hospital for consumptives, and I gave the first injection of tuberculin in Philadelphia before my class at Jefferson Medical College upon a patient with advanced tuberculosis of the larynx in the early eighties. Ten years ago I heard that that man was well

and was a successful ranchman in Wyoming. I have not heard from him since. Fifteen or sixteen years ago a man came to me from the South, with his physician, with extensive ulceration of the larynx. He was placed under tuberculin treatment, and after a number of months his disease was arrested. Two years afterward his life was insured for $100,000 in the Mutual Life Insurance Company of New York.. In that case not only was the injection given hypodermically, but the tuberculin was rubbed over the laryngeal surfaces, and he took rectal injections himself every night. There is no doubt that in this case there was a great success. I know of several other cases still living at different periods of five to fifteen years or more, and doing well. The tuberculin that I have used has always been the old tuberculin of Koch, except when we were unable to get it, and then other forms were used, but they did not appear to present any special advantages. These injections were used very much as the last two speakers have described, beginning with minute doses and gradually increasing them, and studying the patient rather than the disease.

I would like also to state something else. When I began the study of medicine, some fifty-five years ago, I studied under a preceptor, as was customary at that time; and it was his custom then to apply fly blisters as near as possible over the site of the lesion of phthisis. We knew nothing of the bacillus tuberculosis at that time. Many of the cases improved, and since the tuberculin treatment and serum therapy have been applied I have come to the conclusion that possibly the absorption of some of the serum raised by these blisters was beneficial in the same manner as is the serum when injected under the skin; and, acting on that principle, it has been my custom for a number of years with many of my patients to blister the chest below the clavicle, taking care that the blister shall not burst, so that the patient's own serum shall be absorbed on the same principle as in the autogenous methods. I do not often attend these meetings, but would like to take advantage of this opportunity to give my testimony as to the benefit from this treatment in properly selected cases and under proper precautions.

Dr. W. E. Casselberry: I can support the statement of the essayist, Dr. King, referring to the pronounced favorable effects of tuberculin on the larynx in laryngo-pulmonary tuberculosis, especially respecting the cases in which he got a pronounced reaction from a larger dose than was meant, the ultimate effect being good. Similarly I have noticed in a few cases an unexpectedly favorable effect on the larynx to follow the one, two or three tuberculin test doses, injected to produce a diagnostic reaction,

not for treatment, but in which weeks or months afterward there has been marked improvement in the larynx. While considering this likely due to the tuberculin, I scarcely trusted it as a fact, not being able to exclude credit to other circumstances; but the two go together. Dr. King has attributed it to tuberculin, and I have no doubt that he is correct. When the larynx is involved it becomes almost the dominant factor in the case because of its immediate menace to life, and the results of treatment in general up to this time have been discouraging. Therefore, since we have not heretofore had a report based on so large and precise an experience, and if, as it seems, we have found tuberculin to be a remedy, productive in any considerable percentage of cases of such marked benefit as Dr. King has observed, we have made an advance. I have also had a limited experience with the present day minute therapeutic dosage in laryngeal cases, in which, however, recourse was had also to other suitable medical and surgical treatment. Elsewhere I have reported a series of 60 cases with 40 per cent. of arrests, in some of which tuberculin in small doses was given as an important element of the treatment. The internists who see the larger numbers of laryngo-pulmonary cases usually fail to examine the larynx, considering it too technical, but the knack is easily acquired. If these men would take note of the condition of the larynx in all pulmonary cases and, like Dr. King, note the effect on the larynx as well as elsewhere produced by tuberculin, much good would be done to humanity in the suppression of this terrible complication—laryngo-pulmonary tuberculosis.

HISTORY OF A CASE OF RECURRENT PAPILLOMA OF THE LARYNX,

Extending Over Thirty Years, During Which Two Thyrotomies Were Performed.

BY FRANCIS R. PACKARD, M.D., OF PHILADELPHIA.

The patient whose case I report has been kind enough to write me out a brief epitome of his history before coming to me, which tells the story so well that I have merely transcribed it.

"I was born in Birmingham, England, on September 1st, 1838. In 1880, being then occupied as an auctioneer, I noticed my voice beginning to get husky. In the spring of 1881 I caught a severe cold, due to getting soaking wet, and my voice rapidly failed me. I then sought medical advice, but getting no relief from one doctor, consulted others, with the same result. I found they were all treating me for syphilitic sore throat. I then, under the advice of Dr. Kenny of Birmingham, who had consulted Sir John Sawyer as to the nature of the trouble, came to Philadelphia and went to the University Hospital. This was late in November, 1883. At the University I fell into the hands of Dr. John Sheets, of Philadelphia, who was then assistant to Dr. Seiler, who at once diagnosed my trouble as papilloma of the larynx. After many operations by Dr. Seiler, and many more by Dr. Sheets, each of whom removed much growth, they both stated that it returned as fast as it was removed. This was in April, 1884. I then visited Bellevue Hospital, New York City, and attracted the notice of Dr. Seeler, of Newark, N. J., who performed very many operations with the forceps. I attended Dr. Seeler's office until late in September, when by his advice I went to the New York Polyclinic Hospital and became an outdoor patient. Dr. Gleitsmann took a special interest in me, and for some months he tried his very best to clear my larynx; he tried everything then known to the medical profession, but, although he removed an immense lot of papilloma, it seemed to return again in twenty-four hours. At length, to save my life, he persuaded Dr. Gerster, of New York City, to perform a laryngotomy. The operation took place

in July, 1885, and appeared to be a complete success, but in 1887 the growth reappeared. I consulted Dr. Gleitsmann, who succeeded in removing part of it, but the position the growth had taken defied all efforts to remove it. The operations performed by Dr. Gleitsmann, Dr. Lederman and Dr. Sheets carried me along until 1904, when I fell into your hands. The rest of this little story you know better than I do."

Fig. 1.

I first saw the patient on the 19th of October, 1904. He was then 66 years of age, and had had laryngeal trouble for 24 years. He was a strong, large, healthy-looking man (Fig. 1). His voice was so husky that it was with difficulty that one could understand

what he tried to articulate. His breathing was also laborious, with considerable inspiratory dyspnoea. Upon examination, his larynx was found almost occluded by large papillomatous masses projecting into its lumen below the cords on both sides, and from the anterior commisure. There were also small papillomatous masses upon both cords. At this time, and in a number of subsequent sittings, I removed pieces of the growth, but did not succeed in extirpating it, as it recurred with the most wonderful celerity.

In February, 1905, I took him to the Pennsylvania Hospital, where Dr. Robert G. Le Conte divided the thyroid cartilage anteriorly and removed large masses presenting the typical appearance of papilloma. These were submitted to a microscopic examination by Dr. W. T. Longcope, and the report was as follows:—

"Specimen consists of a very small, somewhat dried, gray translucent piece of tissue.

"Microscopical Examination: Sections from small tumor of the larynx show it to be largely composed of a thick layer of squamous cell epithelium, resembling the thickened corium of the skin. Lying beneath this layer is a well-defined uninvaded layer of connective tissue. A small amount of blood is seen lying outside the tumor mass. No inflammatory changes are seen. No signs of malignancy.

"Anatomical Diagnosis: Benign papilloma of the larynx." (Fig. 2).

He made a good recovery from the operation, and his respiration became practically normal; his voice continued somewhat husky, but he could be distinctly understood. From time to time since the operation I have seen him, and he has continued to remain in excellent condition, both generally and locally.

On April 12, 1910, when I examined his larynx, it presented a small irregular projection in the anterior commisure, which I think is nothing but the scar or stump left by the removal of the growth in 1905. His vocal bands have the appearance of rather thick cords, and are a good deal thickened and reddened along their inner margins.

The interesting points in the case are:—

1st. The long time during which the patient has been under

Fig. 2.
Benign Papilloma of the Larynx.

observation, and throughout which intelligent treatment has been directed towards the relief of his condition.

2nd. The fact that throughout that period, practically as far as can be known, there has been no change in the nature of the neoplasm.

3rd. The fact that this growth is so typical as to etiology, occurring in an auctioneer, as to progress and recurrence in spite of repeated removals, as to growth and microscopic appearance, and, lastly, as showing no tendency, in spite of repeated operative interference and traumatism, to undergo any malignant degeneration.

Discussion.

Dr. Samuel Johnston: In cases of papilloma of the larynx, especially in children, excellent results are sometimes obtained without surgical interference; and I beg to report such an example in which the larynx was completely cleared of the growth by the local use of chloride of zinc.

When I saw the case in consultation, the child's larynx was packed with multiple papillomata, and suffocation was imminent. I suggested that preparations be made for a tracheotomy; and in the meanwhile chloride of zinc of the strength of ten grains to the ounce be applied locally and two grains of thyroid extract given internally three times daily. In a few weeks marked improvement was noticeable; the laryngeal mirror showing disintegration of the growth. In three months the larynx was perfectly clear. The patient gained in weight, breathed easily, and both the speaking and singing voice were completely restored.

Two years subsequently I showed the case to Dr. J. N. Mackenzie, who said he could scarcely believe that anything had ever been wrong with the child's vocal organs.

The strength of the application used was ten grains to begin with, increased to twenty grains to the ounce of water.

In cases in which the growth is below the cords it is difficult to make local applications. I have seen, besides this case, two others in adults, and my assistant reports another case in a child where this treatment was equally successful. I hope you will try this treatment when the opportunity offers. What effect the thyroid extract had in retarding the growth, or whether it aided in some way in bringing up the nutrition of the child, and so removing the condition present for the stimulation of the growth, I

cannot say. My assistant, Dr. Frames, deserves the credit for carrying out the details of the treatment.

Dr. D. B. Delavan: The types of papilloma of the larynx that have been so scientifically presented to us by Dr. Packard and that of the case alluded to by Dr. Johnston, namely, the small, inactive growth, on the one hand, and the large, repeatedly recurring growth, are, practically speaking, altogether different diseases, even although histologically the cases may show the same appearance. Some years ago I mentioned alcohol for the treatment of the type of growth for which Dr. Johnston recommends chloride of zinc. Others use other remedies in these cases. Lately Dundas Grant has recommended alcohol with salicylic acid. The severe type cannot be cured by such measures. Every one knows the extreme difficulty of dealing with these repeatedly recurring cases. Recently Dr. Robert Abbe, of New York, who has been experimenting much with radium, has found it to be effective in the case of external warts. Papilloma is analogous to surface warts, and, if the wart can be removed by radium, Dr. Abbe reasons that the papilloma can also be cured by it. With the use of the bronchoscope and the application of radium we have possibly the means of curing these intractable cases more effectually than anything that has heretofore been used.

Dr. C. W. Richardson: The case reported by Dr. Packard was most interesting, as also are those referred to by Dr. Delavan. We must bear in mind that there are practically two great divisions of papillamatous growths in the larynx—one a simple papilloma, which has no tendency to recur, and the multiple recurring papillomata. In the simple variety they have a tendency to cease growing, and practically disappear at a certain period in their life history. If we happen to catch these growths in the time when they are retrogressing, the case apparently gets well. I had a case of papilloma of this character which acted similarly to Dr. Johnston's case, but under different treatment. The patient had a small papilloma which filled the larynx. The parents were not disposed to have anything done to it until the child was twelve years of age. At this time it was brought to me, and I said it was time to take it out. I used no means whatever except to teach the child the use of the sound, and after two or three applications of the sound I noticed that the growth was smaller; in a week or more, after one or two further applications, there was no question of its being smaller; I waited two weeks without doing anything more, and the child became better—it was fully half its previous size. I made another application of the sound, and in four or five weeks the growth was practically gone and the throat presented the ordinary normal laryngeal picture. The growth had extended from the anterior commissure almost

to the arytenoid. I have another case that almost bears out Dr. Packard's case; the patient was not so old, but he came under my observation some years ago, and the result was very satisfactory.

Dr. J. P. Clark: Dr. Packard's case interests me very much, and one or two points are unusual. In my experience with papillomata in adults I have never known a case where there was positive evidence that it began in adult life. From this history the papilloma apparently began at forty. In a series which I reported a number of years ago the symptoms began in childhood. It is also unusual in my experience that a papilloma of the larynx in an adult should show such a strong tendency to recurrence. My cases have yielded much more quickly to removal.

In regard to the subject of papilloma of the larynx in children, as I pointed out in a paper read before this Association two years ago, they may disappear without treatment. In microscopic characteristics they resemble very closely warts on the skin. We know the various remedies that children resort to for warts on the skin, and the almost magical effects which they sometimes produce. In other words, in a given case of papilloma of the larynx it is hard to say how much the treatment had to do with the disappearance of the papilloma.

As I have stated elsewhere, I believe that papilloma of the larynx in children will yield to no treatment which we know of to-day until the agent, whatever it may be, which determines its growth ceases to be active. I also believe, from my experience, that tracheotomy tends to diminish this activity.

Dr. W. E. Casselberry: I have seen a number of cases of papilloma which originated after adult life, both the circumscribed and diffused persistently recurring varieties. I feel that a description limited to two varieties of this disease is inadequate—they are scarcely divisable into distinct types—as they range all the way from the circumscribed narrowly pedunculated growth to the persistently recurring diffused mass which fills the larynx. I have for two years past had under observation a case of the recurrent diffused type which commenced after thirty-five years of age. The patient is now well; that is, he has been able for one and one-half years past to perform his legal professional duties with a good voice, but I see him once a month, and sometimes still cauterize recurring rootlets. At the International Medical Congress in Washington in 1887 I proposed the use of the galvano-cautery for the destruction of the base of papilloma of the larynx in adults. I have since used it with increasing satisfaction. I showed an electrode devised for the purpose. One might think it liable to injure the vocal cords, but it does not; it is astonishing how much papillomatous cordal surface one can sear and not affect the voice. Papilloma is soft and is easily de-

stroyed, while the cords, being fibrous, are not easily destroyed, and with reasonable care are not injured, the cord recovering its clear outline and the voice remaining in good order. The growth in the case referred to was very profuse and the bulk of it I removed first by forceps and direct laryngoscopy, only the remnants being treated by cauterization. Attempts to pick off such remnants by forceps seems to promote the growth, whereas after cauterization it does not grow up again in that spot, and in time all spots can be seared and the disease cured.

Dr. W. K. Simpson: It is very well known that papilloma in children or very young adults is susceptible to many types of treatment, and this seems to be an experience meeting along that line. I have followed Dr. Casselberry's treatment with the cautery and have had very good results, but the best result I had was in the case of a young woman with a very extensive papillomatous growth recurring after every type of instrumentation; after the application of pure lactic acid no further recurrences took place. The recurrences ceased with perfect restoration of the vocal cord and voice. I have come to the conclusion since then that this is one of the most effective escharotics we have to be applied to the operation surface.

Dr. H. L. Swain: It is end results that we like to know about in these cases. I have this last winter seen two old patients where work was done on the larynx many years ago, an adult then aged thirty-five, seen twenty years ago, who had a whole lot of papillomatous growth which did not recur very rapidly, but every three or four months for as many years I removed here and there a small one. Then I thought that instrumentation might be the cause of the trouble, and omitted it, although she often came back asking that something be done. She did not have to use her vioce much, so I desisted for ten years and did nothing. When seen this winter she had still two or three small masses, but is apparently getting on all right. On another I did a thyrotomy when the obstruction became too great; the thyroid was split, the growth removed and the base burned out with the paquelin cautery. The growth did not recur, and for five years I did not see her; but when examined this winter she has two or three very small growths. In both of these cases I think it is best not to disturb them instrumentally if it can be avoided.

Dr. B. R. Shurly: I have had several of these cases in the last fifteen years and have carried out the same procedure, that of tracheotomy and removal of all the growth at the time of operation as far as possible. They have all recovered. One had a thyrotomy. It has always seemed to me that the principles of treatment were tracheotomy and rest, and that the applications

were incidents in the recovery. Ordinarily, putting the larynx at rest is sufficient for the recovery of these cases.

Dr. W. K. Simpson: If in the case of an adult where undoubtedly the traumatism was from excessive use of the voice, as in the case of an actor, putting the throat at rest would probably cure it, for there you remove the cause.

Dr. Shurly: I should think the same principle would apply in all papilloma in adults; sometimes a different problem, the intralaryngeal removal, is the one resorted to. The invention of the bronchoscope and Dr. Jackson's instruments have revolutionized our procedures along this line, but there is danger that the younger generation of laryngologists may fail to master the delicate intralaryngeal manipulations of the older school.

Dr. R. C. Myles: I have a case to which I have given much consideration in a woman about fifty years of age. I removed at different intervals 164 papillomata from her larynx and trachea. She had diffuse papillomatous degeneration of the vocal cords, ventricular bands, epiglottis, and quite a considerable area over the subglottic region extending into the trachea. First it was important that she should breathe, and second that she should talk. The question was to place her in position to do so. I removed carefully ten, fifteen or twenty of the growths at a sitting. A modification of Dr. Dundas Grant's forceps was found the most effective for the subglottic growths. I have been able to make her breathe and talk comfortably, and there are now only a few small growths, one which I have left all the time under the epiglottis; it was not bothering her, and has remained stationary without seeming to give her any trouble for ten years. I was careful not to remove them from both sides of the anterior chink at the same time. They recur every year to a certain extent, and after a seance she is comfortable again.

Dr. A. W. Watson: I wish to add my testimony to Dr. Casselberry's in regard to the use of the galvano-cautery. I have been using it for many years in the treatment of papilloma in adults and have never had any case that did not yield to its careful use. I believe that even such a case as that described by Dr. Packard could be controlled by it.

Dr. Packard: I epitomized the means employed. The man is very intelligent. I do not know whether or not he has had the galvano-cautery, but he has had all kinds of applications. He asked me particularly not to do any intralaryngeal work if it could be avoided, for he had had that and it recurred after every such procedure. I thought it better to remove the entire mass rather than a piece of tissue in order that the microscopic examination could be made so thorough as to determine positively the character of the growth.

INFLUENCE OF THE USE OF THE AUTOMOBILE UPON THE UPPER AIR PASSAGES.

BY D. BRYSON DELAVAN, M.D.

The subject of the automobile itself would seem to need no introduction, even without its own innate aggressiveness. Probably no invention has ever been more thoroughly exploited.

The almost universal adaptation of the motor vehicle for pleasure as well as for business purposes implies the fact that countless numbers of people come within its influence, some as actual users of it and some as mere spectators of its use. It becomes therefore a matter of great human interest, of actual importance to the State, to know the effects of the new means of locomotion upon the physical welfare of the public. To that end my subject is presented, in the hope that your discussion of it may bring definite and useful results.

The influence of the automobile upon the mind, the morals, and the physical being of those who use it presents questions of interest well worthy of study. Already more or less has been written concerning these topics. Its effects, however, upon the upper air passages do not seem to have attracted serious attention, and yet offer opportunity for considerable investigation and comment.

Automobile literature furnishes nothing upon the subject, while individual experience is hardly sufficient for so wide a field.

The automobile may effect both him who uses it and him who does not. The exposure to one who rides in an open vehicle may bring about effects which would not endanger the one riding in a limousine. The chauffeur may also be exposed to dangers peculiar to his position. As to the man who walks, it is his part to inhale the fumes which poison the atmosphere of our best avenues and to either be driven from his home by the noise of the autos or choked by the dust which is raised by them and blown in his direction.

If the experience of other occupations which are known to be

injurious to the air passages is any criterion, it is time that we had undertaken to consider the influence of the automobile.

The factors which may work injury may be divided into two groups, namely, first, conditions relating to the air itself, and, second, impurities carried by or suspended in the air. The first includes temperature, air currents and air pressure; the second, dust and smoke. Sudden and violent changes of temperature are often encountered by the motorist. Exposure to strong draughts is also a common experience, the draughts being due to natural air currents or to the rapid motion of the car. Where the car is speeding in the face of a breeze the resulting increase of air pressure must be considerable.*

Sudden change of temperature or rapid radiation of body heat due to exposure to air currents may cause chill, and, indirectly, the latter's well known results upon the breathing apparatus. Increased atmospheric pressure, especially when combined with cold, must of necessity exert important influences upon the respiratory region, from the nasal cavities and their communicating passages to the ultimate vesicles of the lungs. Examples of this are common. Thus, during the height of the great blizzard of 1888, many persons attempted to walk from their places of business to their homes, facing the storm. The number of those whose air passages suffered injury was incredible, while the variety of the affections included a fair proportion of the inflammatory conditions possible to the ears, nasal region, pharynx, larynx, trachea, bronchi and lungs. Deaths were numerous, while there are many patients suffering from chronic disorders to-day who date the origin of their troubles from that or some similar experience. A rate of thirty miles an hour constitutes a stiff breeze, while sixty miles represents a gale. These facts we know, and yet easily forget in the exhilaration of the ride.

The second injurious factor is the impurities which may be inhaled with the inspired air. These consist of dust, of smoke

*With regard to the resistance of the wind, it has been suggested that at speeds below twenty miles an hour the effect of wind resistance is too slight to be measurable. Considering surfaces at right angles to the normal plane of travel of the automobile, resistance begins to show at about fifteen miles an hour. It increases slowly, reaching about 2½ pounds a square foot at 30 miles an hour. Higher speed results in rapidly increasing rate of resistance, until at 60 miles an hour the pressure is about 13 pounds. At 90 miles it has increased to about 29 pounds.

and of other matters among which may be mentioned plant products and small insects. The deleterious effects of dust upon the air passages are obvious. Those engaged in dusty occupations such as emery grinding, certain kinds of stone cutting, the handling of furs, and the manufacture of certain powders and fabrics, invariably suffer. Smoke also irritates them, and the smoke of the auto is especially irritating.

Another source of irritation to the air passages is one not generally thought of, but, in the experience of the writer, of sufficient importance to warrant attention. I refer to the presence in the air at certain times and places of large numbers of small winged insects, and also to the products of plants, shrubs and trees, which at certain seasons of the year fly in the air, especially in the neighborhood of their production. Mosquitoes and gnats in great variety are frequently encountered after sundown in passing over country roads, especially if the latter run through growths of trees or near swamp lands. Insects of larger type may endanger the eyes. The smaller ones not only offer the same possibility, but may readily be inhaled, either into the nasal cavities or into the larynx or trachea. Any one who has experienced such an accident will remember its irritating effects, which may not only be severe for the present, but may leave behind the possibilities of serious trouble.

Dust may be irritating from its mechanical properties. Thus fine sand, as has often been demonstrated in its effect upon stone workers, has injurious properties which depend upon the sharp cutting qualities of the particles of silicate of which the dust is composed. Other kinds of dust may be harmful, not only by reason of the peculiar shape of the particles but also because of the irritating nature of the substance itself, as, for instance, in the case of the horse droppings and the many other accompaniments of ordinary street dust.

With regard to the equipment of the motorist every conceivable appliance and convenience is provided for him. This is especially true of protections for the eye, which are supplied by the shops in great variety. In considering this, however, it at once appeals to one as strange that protection of the breathing apparatus against dust and severe winds seems to be neglected. I have

searched many shops, but have never yet found a satisfactory respirator, nor do I know anything in recent scientific literature bearing upon the subject.

Almost the single exception to this statement is the face-guard used in speeding for protection against the wind. This is of simple pattern and construction, and for its purpose is said to be effective. It can hardly be successful, however, in excluding dust. For the latter purpose none of the old-fashioned respirators, such as have been worn in London for many years for protection against fog, nor those of the Morrell Mackenzie type for preventing the inhalation of dust by emery grinders, stone workers and the like, are satisfactory. The majority of those who attempt any protection at all are ladies who use chiffon veils in which they envelop the entire head. This method offers a certain amount of relief, but it is certainly not ideal.

The lack of attention which has been given to the subject of respirators would imply that dust is an unimportant factor. In regions where the roads are well cared for and properly oiled this is to some extent true. Any one who has seen automobile parties coming in after long runs in dry weather through an open country will remember the extent to which everything pertaining to the motor and its occupants has been covered with dust. This is especially true of many districts in Europe where oiling of the roads is unknown and where limestone or other comparatively soft material used in making the roads has furnished a fine powdery grit which rises in dense clouds and penetrates everywhere.

In dealing with the question of automobile smoke several factors are to be considered. The irritating particles may perhaps be too small in size to exert much mechanical influence upon the mucous membranes, but their quality may be such as to cause decided irritation. Added to this is the pungent odor which in itself may be excessively irritating.

While some may doubt the harmfulness of the emanations from the exhaust of the automobile, it is hardly possible to suppose that they can be entirely without effect. Even to healthy membranes their presence in the air is consciously annoying. Where the mucous linings of the air passages are already for any reason in a sensitive condition there is no question, if we may

rely upon persons of intelligence and experience who have considered the matter, that the automobile fumes have caused them painful annoyance at the time and in some cases long continued and severe after irritation. This is often observed in cases of ear trouble, due to Eustachian catarrh, while patients suffering from asthma, bronchitis, tuberculosis and the like are undoubtedly affected by it.

Without question irritated mucous membranes are more especially liable to infections of a general nature; even supposing the smoke and gases from the auto to be sterile, their ultimate contributory effects may easily become important, particularly when combined with the notoriously microbe-laden dust of city streets.

Theoretically, therefore, the use of the automobile should be productive of a decided increase in the average of respiratory ills. Whether or not it has actually so resulted is a question. Taking up the causes of injury, we will first refer to chill. This may be acquired through unsuitable or insufficient clothing, or through clothing improperly applied. Not only should the body be protected, but the limbs should be carefully covered, especially in open motors. A coat, otherwise warm, may be cut too low in the collar. The idea that undue exposure of the neck and throat tends to strengthen the parts is a popular fallacy. No such custom prevails with the Eskimos and others of exposed life dwelling in cold latitudes. No part of the body would seem to demand more careful protection than that adjacent to the top of the sternum, where center the most important blood vessels of the body, many of them within short distances of the outer world. A coat which does not properly protect the throat is like a roofless house. Any one who has skated, or has sailed an ice-boat in very cold weather, or who has had experience in mountain climbing at high altitudes will readily understand this. In motoring, neither extreme cold nor great altitudes are necessary to bring about conditions which rapidly lower the body temperature. As with the neck so with the feet. Low shoes, unprotected ankles and want of rugs may quickly work disaster. Some of the head coverings used are admirable. Others are exceedingly bad, comfort and safety being sacrificed to appearance, with no attempt to

protect and shield the face and neck. The subject of proper underclothing must also be considered. It is easy to become chilled in an automobile when one enters it after leaving a warm room, even when well protected with clothing. Still worse to ride in an open machine in the country, fresh from an overheated train and with thin clothes. This latter situation sometimes confronts the city consultant when he is called out of town.

Apparently the worst case is that of the chauffeur who, in the effort to replace a tire or repair some other injury, works himself into profuse perspiration and then upon the driver's seat makes up lost time against a cold breeze. Such exposure should be prolific of throat and lung troubles. As a matter of fact it does not seem to be. This may be accounted for by the youthful vigor and personal power of resistance of those who engage in the work of motor driving, as well as by the health-giving effects of a life of activity in the open air.

Having considered the above-mentioned factors, the next step would be to study their effects upon the upper air passages in healthy individuals.

To that end we have endeavored to make a collective investigation of the subject and have taken the case of the chauffeur as the basis of study, selecting him because, as a professional, he devotes a maximum amount of time to his work, because his position is more exposed than that of others, and because he may be supposed to represent a fair type of the average healthy individual. In order to gain the most reliable information possible, we have interviewed the medical departments of four leading life insurance companies. All agree that the subject should be, and is being, investigated, but state that it has only lately come up, that nothing less than a large collection of statistics will be of value, and that the length of time which has elapsed since it was taken in hand is too short to admit of reliable deductions and final scientific results. Up to the present time, as far as their observations have gone, none of them have noticed any special effect of the use of the automobile upon the upper air passages. One of the companies states that while the mortality rate is greater in these cases than with ordinary drivers of vehicles, this is owing to accident and not to disease and has nothing to do with the real ob-

ject of our investigation. One company makes no extra rate for risk of illness in chauffeurs. It aims to accept only chauffeurs of good standing and of temperate lives, and it believes that any special risks of illness to which they may be subjected are counterbalanced by the non-use of alcoholics and by the life in the open air. Another company regards the chauffeur as not inferior as a risk and accepts him on equal terms with others of his general grade. A third agrees substantially with the above. In the case of the fourth company an excess rate of one-half of one per cent was formerly charged chauffeurs. Lately, this excess has been removed and they are taken at the usual rates.

In short, the medical departments of these companies, the largest and most important in the country, have not found that chauffeurs are apparently more liable to the serious respiratory diseases which threaten life, including tuberculosis, than are coachmen. Both, of course, are apt to suffer from pneumonia due to exposure, one of the few conditions likely to come to the notice of life insurance authorities. Diseases not directly fatal, such as sinusitis, would probably not be reported to them. It is desirable that a systematic investigation be made to determine the influence of the automobile upon all respiratory conditions. Finally, if it should appear that they are actually productive of irritation in cases where the condition of the air passages is normal, it would be easy to appreciate their influence upon special conditions of the respiratory tract likely to be aggravated by them.

We will now consider what some of these conditions are. A good illustration would be offered by a case of acute coryza. In this affection it is pre-requisite to the successful treatment of the case that the patient be kept in an even temperature, and that he be allowed to breathe pure air. The treatment also demands that the surface of the body be protected from chill. We secure quietude and warmth by sending the patient to bed. It will readily be seen how exposure in an automobile apparently violates all of the first principles of treatment.

That this criticism is not theoretical may be amply proved by common experience. In cases where there is any tendency to involvement of the nasal sinuses in such acute attacks, automobile riding offers every possible element of danger, including the

special risk from increased air pressure of forcing elements of infection into the sinuses or into the Eustachian tubes.

The prevalence of sinus disease and of acute infections of the ear in recent years has been attributed to the influence of grippe. In the treatment of these cases, however, experience demonstrates that a patient taken in hand at the early part of the attack, placed under proper conditions and given suitable treatment will generally escape serious trouble. Even if the sinuses have been invaded, a few days will generally suffice to check the inflammation and cure the case. Lack of treatment and of protection, however, and, above all things, exposure to inclement weather, will not only remove the possibility of spontaneous cure which is often present, but in countless instances has aggravated the trouble to the extent of causing infection of other sinuses, intensifying the symptoms and thereby prolonging the subsidence of the attack, or creating complications of the gravest nature. It is just such cases which lapse into chronic conditions, often presenting the greatest difficulties and the most serious dangers. In chronic disease of the sinuses, incautious motoring may expose the patient to especial risk. The same is true in cases of old suppurative conditions of the ear, for reasons too evident to need explanation.

The effect of automobile riding upon the symptom of tinnitus is an interesting and important study. In a patient subject to this phenomenon it may be laid down as a general axiom that the better the condtion of the body in general and of the neighborhood of the ears in particular, the less the tinnitus will be in evidence. Naturally, any increase in the tinnitus would imply some additional irritation in the ears or in those parts irritation of which will produce reflexes resulting in tinnitus. It is a common experience of the victims of tinnitus to find that the ringing in the ears is increased by riding in an automobile. This is especially the case if the ears are unprotected. Such increase may be due either to the irritation of the air currents upon the tympanum, to the results of air pressure in those whose Eustachian tubes are clogged, or to hyperaemia of the naso-pharyngeal membranes with extension into the Eustachian tubes. Patients susceptible to increased tinnitus, therefore, should be warned of the effect of

the automobile, and if they ride should be urged to so protect themselves that the ears will not be endangered. At the very least, the wearing of a cotton plug in the external auditory canal should be enjoined.

In acute catarrhal conditions in general of the air passages motoring would seem to be contra-indicated. In many sub-acute and chronic catarrhal conditions, however, it appears to be distinctly advantageous. In my own experience many such cases have been benefited, and more than one patient of long standing has been cured.

In bronchitis, asthma and emphyzema the rules which would obtain with regard to the avoidance of sudden changes of temperature and exposure to strong winds would be applicable to the use of the automobile.

The same may be said with regard to pulmonary tuberculosis. Several cases have been reported to me in which bronchial asthma, vaso-motor coryza and hay-fever have been markedly relieved by it.

The question, however, of the influence of the automobile upon those inclined to throat and pulmonary tuberculosis is another interesting topic. An abundance of fresh, invigorating air should be beneficial. Draughts, sudden changes of temperature, dust, smoke and irritating gases must, of course, be avoided. A case has been reported to me of a lady who made a motor trip from New York to Chicago and back again in very dry weather. She left apparently in good health and returned with well-marked pulmonary tuberculosis. The investigations of David Twichell have shown that the tubercle bacillus quickly succumbs to sunlight. It is unlikely that the patient above mentioned contracted tuberculosis from the dust of the roadways. Possibly the disease may have been latent or unsuspected when she started and was developed by the excitement and fatigue of the journey, coupled with the mechanical irritation to the respiratory membranes of the dust.

Again, the membranes having been irritated by dust, the germ may have been acquired in some lodging place upon the way.

Possibly this isolated case represents a rare accident in which

the influence of the automobile is not entirely evident. In any case it would seem worthy of notice.

Good authorities, of course, interdict motoring in tuberculous subjects whose temperature is above normal. In certain cases, particularly of the nervous, restless type, the mild stimulation of the circulation, deep breathing and lively mental diversion have been distinctly beneficial.

The advantages of the open car, also, are not to be ignored. The entire freedom of the circulation of the air, even in cold weather, is an invigorating tonic to those vigorous enough to profit by it. Indeed, there are some who claim that they never take cold unless they ride in a closed car. Here, of course, the personal equation must settle the question.

In estimating its effect upon the air passages, the fact that the automobile may be either open, protected or enclosed must be considered. No vehicle is more luxurious or indeed more safe for those who are feeble and susceptible to the effect of cold than a high-grade, well appointed modern car. With the windows properly arranged draughts can be prevented and even the temperature can to some degree be controlled. Under such conditions an invalid might travel proper distances without injury and with highly beneficial results. To the same person a long ride in an open or a partly protected car might be attended with discomfort and followed by disaster. In advising a patient, therefore, it is necessary to specify accurately the variety of car he should use and then instruct him as to the precautions necessary in his particular case.

Here again the personal equation becomes important. The same currents of air which would invigorate and strengthen a person in robust health might be harmful in conditions of disease of the air passages, as they are recognized to be in disorders of other parts.

In a paper recently presented in Philadelphia by Professor James Tyson on the effect of the use of the automobile upon the heart, Dr. Tyson maintains that many cases of cardiac disease are markedly benefited, the fresh air, moderate exercise, gentle stimulation of the circulation and mental diversion having an excellent influence.

So, in properly selected cases of respiratory trouble the patients thrive under it, owing to improved oxygenation and nutrition.

To sum up the matter, it would appear that under certain conditions and in certain cases the motorist may expose himself to positive risks. These risks may sometimes be modified or even removed by the use of proper precaution in the selection of a machine and by the exercise of wisdom in using it. Properly used in suitable cases, the automobile may be a valuable therapeutic agent.

These things being true, it is time that knowledge upon the subject had been obtained sufficient to enable us to warn the public of the possibilities of danger and to instruct them as to the best means of protection.

In addition to those precautions of a personal nature which each one using the automobile should observe, the safety and comfort of the public at large would be greatly enhanced:

1. By good country roads, kept in good order.

2. By well-paved city streets, kept free from dirt and from the fine dust which is now allowed to remain after the coarser matters have been removed.

3. By the enforcement of the laws against automobile smoke in our cities as the same laws are enforced in the principal cities of Europe.

Thus would much just criticism of the motor be silenced and many friends be gained to a worthy cause.

All things considered, the final verdict seems decidedly in its favor. The authority of life insurance thus far has not been able to discriminate against it, high medical authority commends it in kindred directions, and common sense, together with experience, seems to sustain it.

Discussion.

Dr. B. R. Shurly: Living where 60 per cent of all the automobiles manufactured in the world are found, a number of observations have come to me where the automobile was the etiological factor in the development of pathological conditions of the respiratory tract. We have an absolutely new occupation developed in the last few years—that of tester of automobiles.

He passes a number of hours in the automobile every day, and is subject to the ill effects of the exhaust pipes for a large part of each day. I have observed conditions of nasal deflections and other abnormal conditions which under other occupations showed no symptoms whatever, developed in this class of men into pathological conditions requiring interference. The use of the automobile predisposes to the extension of acute conditions that are present, and these individuals suffer particularly from extensive complications when they use the open machine. I have seen a number of cases of facial paralysis, with the automobile as the particular etiological factor, with attending ear and throat complications. One point that develops from the high speed that these testers take is the fact that many of them keep the mouth open; as soon as they develop the high speed they develop the so-called "automobile face," with the open mouth, and these individuals are subjected to extra dangers of infection. We have had a very extensive pneumococcus infection this last Winter, particularly aggravated in those that use the open machine.

Dr. J. O. Roe: Before the wind-shield came into use the automobile was responsible for many cases of sinus diseases, particularly of the frontal sinus, induced by the air pressure and strong currents of cold air against the face. The wind-shield has, in my opinion, done more to lessen such dangers than any other device. It was in recognition of this danger and for the purpose of avoiding these disagreeable air currents that the wind-shield was invented and adopted by automobilists. I am, therefore, a little surprised that neither Dr. Delavan nor any of the speakers have mentioned it.

I have a number of cases of frontal sinus disease—I think about half a dozen—where the cause of the trouble was attributed by the patients and directly traceable to colds contracted from the strong wind currents against the face while motoring at a rapid pace. I also saw similar cases in the practise of two of my colleagues, and some cases were reported in journals where the onset of the sinus trouble was ascribed directly to this cause. Since the wind-shield has been so generally used, none of the cases of frontal sinus disease that I have seen have been ascribed directly to the use of the automobile.

Dr. Solis-Cohen: Due to excessive speed?

Dr. Roe: Yes.

Dr. Emil Mayer: It may be a matter of interest to state that at Boston, where Dr. Farlow presided, in discussing Dr. Hinkel's paper (Transactions American Laryngological Association, 1902, p. 107), I called attention to the automobile as an etiogolical factor in accessory sinus disease.

Dr. W. E. Casselberry: Excepting the points made by the essayist, to which I subscribe, I feel that the statements, especially those attributing sinus disease to the use of the automobile, are so vague that they do not carry conviction. That people can "take cold" by exposure and by dust irritation while riding in automobiles, as well as in other ways, goes without saying, but the coincidence of an acute inflammation of the frontal sinus with the use of an automobile is of little value as evidence, when so many are using it without contracting sinus disease.

Dr. Delavan: The automobile is capable of doing harm as well as much good. But little injury will result if good judgment is employed by those who can use it with safety, and if the proper instruction is given to those who should limit their use of it, or especially protect themselves in using it. Some of the conditions which should interdict its use are indefinite and not always easy of recognition. It would be well for us to study them and place ourselves on record as recommending or discouraging the automobile according to the circumstances of the given cases.

THE MANIFESTATIONS OF RECURRENT INFLUENZA IN THE NOSE AND THROAT.

BY JOSEPH L. GOODALE, M.D.

The object of the following paper is to call your attention to a class of cases characterized by annual recurrences of influenza or influenza-like attacks, which exhibit certain definite clinical phenomena.

At the outset it should be said that the term influenza is necessarily used with a certain latitude. F. T. Lord[1] reports an epidemic of influenza taking place in Boston in 1907 and 1908, from which he comes to the conclusion that until the etiology of the disease is finally determined it seems best to continue the use of the term influenza to designate a complex of symptoms without regard to the apparent bacterial cause. The same writer[2] studied the bacteriological findings occurring in inter-epidemic cases, finding the influenza bacillus in practically pure culture in 25 per cent. of the cases, and the same organism mixed with other bacteria in 59 per cent. He concludes that the etiological unit appears to be lacking in the epidemic cases, not only as regards the influenza bacillus, but also for other organisms, since no one group of bacteria could be demonstrated as a constant invader in the specimens. In the absence of other discoverable causes he comes to the conclusion that various organisms, as influenza bacillus, the pneumococcus, the micrococcus catarrhalis, the pyogenic cocci and others, singly or combined, are responsible not only for the inter-epidemic, but also for these epidemic cases with the clinical picture of influenza.

In an examination of cases by William H. Park[3] in 1905, of an epidemic in New York City, it was shown that pneumococci and streptococci were usually present in association with influ-

[1]Lord (F. T.), Journ. Med. Research, XIX., No. 2.
[2]Lord, Boston Med. and Surg. Journ., May 11 and 18, 1905.
[3]Park, N. Y. Med. Journ., March 18, 1905.

enza bacilli. These occurred in normal individuals, as well as those suffering from colds, grippe and bronchitis. It seemed reasonable to assume that with an inflammation of the mucous membrane, these micro-organisms increase in number and virulence. Park came to the conclusion that a variety of micro-organisms exist, which, under ordinary circumstances, are innocuous, but which becomes virulent when the natural resistance of the tissues is lowered by a cold. It is also probable that the same micro-organism may exhibit an increase of virulence during an infection, and that the same bacterium when transported to another throat is then better prepared to excite the disease than the organisms already existing in the individual. During an epidemic the virulence is so increased by frequent transplantations that in a certain number of individuals the simple deposition of the bacterium upon the mucous membrane is able to excite the disease. He comes to the conclusion that the bacteriological examination in these cases is more of scientific than of practical interest.

In routine work, therefore, where bacteriological examinations are not made we may be justified in making our diagnosis of influenza by the clinical phenomena. These enable us to say with a fair degree of accuracy how far the bacilli of influenza may be an etiological factor in the production of the symptoms-complex. Among the multifarious types of acute inflammation of the upper air passages certain salient features are conspicuously characteristic of the different pathogenic micro-organisms. Thus with the staphylococcus pyogenes we expect pus formation; with the streptococcus, a more intense inflammation and production of fibrin; with the pneumococcus and the diphtheria bacillus, a fibrin formation; each micro-organism having also a more or less well-marked clinical picture. In the differentiation of these affections the following arrangement is helpful to me from the standpoint of etiology: First, I am accustomed to exclude influenza in those acute inflammations of the upper air passages, invading primarily the columnar, ciliated mucous membrane of the nose, larynx and trachea, in which the element of trauma plays a considerable part. We may thus find such conditions to arise from exposure to dust, irritating vapors and

excessive use of the voice, also from exposure of the throat to cold winds to which it has not been previously accustomed, as in the case of an individual, normally a nose-breather, suddenly obliged to breathe through the mouth, and to face a cold wind laden with dust. Under such circumstances an attack of primary laryngitis or tracheitis is to be expected. Within the last few years this type of case, since the advent of motoring, has become especially frequent. To my mind, these cases are primarily traumatic and only secondarily infectious inflammations, and are to be treated locally from this point of view, the object being chiefly to provide rest for the part and a protective covering.

Second, I exclude influenza in conditions where the inflammation originates in the lymphoid tissue of the fauces and completes its history in these situations. These conditions are primarily infectious rather than traumatic, and comprise the various forms of acute inflammation of the faucial, pharyngeal and lingual tonsils. In these cases the inflammation does not extend to the neighboring regions beyond a slight degree. The pathogenic micro-organisms are chiefly the streptococcus, staphylococcus and pneumococcus. (Diphtheria is omitted from consideration.)

The influenza group of inflammations of the upper air passages is characterized in its typical form by the following phenomena: Pathologically the ordinary inflammatory alterations are seen to be marked by a predominance of epithelial desquamation and by submucous oedema. Clinically we find sudden onset, fever, prostration, accompanied or followed by marked depression of spirits.

Such is the picture usually presented by the individual experiencing his first attack of influenza. With the recurrence of the inflammation in successive years, however, a certain relative tolerance to the toxine appears to be acquired by the system. We find under these circumstances the same sudden onset, but symptoms throughout of less intensity, at times difficult to distinguish from ordinary traumatic colds. A distinguishing feature is, however, the remarkable persistence of purulent discharge from the affected regions, whether sinuses, trachea or

bronchi, their slow tendency to recovery and the elevations of temperature excited by physical exertion.

In the past few years my attention has been especially attracted by a group of cases exhibiting a well-defined symptom-complex, and it is to this that I wish to call your attention.

Briefly, these cases are characterized by a primary involvement of lymphoid tissue in the pharynx or nasopharynx, and an immediate extension of the inflammatory phenomena to the mucous membrane of the sinuses, trachea and bronchi, with simultaneous subsidence of the inflammation in the lymphoid tissue. Examining these patients now in more detail, we find a past history of annual attacks of inflammation, the earlier ones intense and prostrating, but becoming progressively milder. In the present illness, examination of the throat at the onset shows reddening and swelling of one or more pharyngeal granules or of the tonsils, accompanied by moderate pain, or at times only a slight burning sensation on swallowing. It is important to note that this involvement of the lymphoid tissue precedes any disturbance of the nose or lower air passages. It is always transitory, but its disappearance is immediately followed by inflammation of the sinuses, and of the trachea or bronchial tubes. A characteristic occurrence is acute inflammation of the ethmoid sinuses on one side, and of a definite region in the bronchi on the corresponding side. Purulent discharge appears in the nose, and simultaneously cough with purulent expectoration. In these cases I have found the ethmoid more frequently affected than any other sinus. It is to be noted that if deviation of the ethmoid plate of the septum exists, it is the middle turbinate region opposite the concavity which is more frequently involved than its fellow on the opposite side. Examination of the chest shows a bronchitis limited to a small, well-defined region. At times physical signs in the chest may be wanting, but the patient complains of a sensation of wheezing pain or lameness on one side. These conditions may last for several weeks. The cough is severe and out of proportion to the amount of expectoration. There is manifestly a nervous element in its causation. It is often referred to a particular spot in the pharynx, which shifts its seat from day to day, moving from one pharyngeal granule to another.

While sometimes considerable loss of strength, color and flesh accompanies these manifestations, yet often the patient shows only a moderate depreciation of vitality, being troubled chiefly by the profuse purulent discharge from the sinuses and bronchi. As these symptoms usually last for several weeks, the question of tuberculosis is apt to be raised in the minds both of the patient and his physician. In addition to the absence of tubercle bacilli in the sputum, the most reassuring element is the history of previous similar attacks. It is, in fact, so regular an affection that patients at the very onset of a pharyngeal pain have predicted to me with accuracy the subsequent course of the disease.

In view of the regular involvement of a given sinus and of a definite bronchial area, the question suggests itself, what is the pathological condition existing between attacks in these regions which predisposes them to invasion? In the nose, this query is sometimes sufficiently answered by the demonstration of chronic hyperthrophy or actual polypoid degeneration of the mucous membrane of the affected middle turbinate. In the bronchi we have, so far as I know, no direct evidence from post-mortem findings. Whether a condition of bronchiectasis or hypertrophy of the bronchial mucous membrane exists, either singly or in association, remains to be determined. It would seem probable, however, that a condition is present in a well-defined bronchial area, analogous to that which can be observed in the ethmoid sinuses.

With regard to treatment, I may first say that out of over twenty cases observed in the past few years I do not remember to have been able to abort the attack in a single instance. When once the lymphoid elements in the pharynx have become inflamed, the local application of guaiacum, or of the silver salts, has only doubtfully shortened the pharyngeal symptoms, but the sinus and bronchial inflammation has succeeded with regularity and apparently uninfluenced. The measures of chief importance have seemed to me to be a change of air during the attack, and an obliteration as far as possible of the lymphoid elements in the pharynx during the intervals.

With reference to a change of air in these cases, it has seemed to me, in the early stages, while the symptoms are increasing in

intensity, that transition to a colder, drier and higher region was more productive of harm than good. The symptoms appeared, under these circumstances, to be aggravated, the cough was made worse and the fever prolonged. I have come, therefore, to regard perfect rest at home as the best plan to pursue in the first half of the affection. After the inflammation has passed the acute stage, and the fever has subsided, it has seemed to me that a change in the Winter months to a warm, moist atmosphere gave little improvement. Such places are Charleston and the whole coast from South Carolina to Palm Beach. The air in these regions during the Winter is laden with moisture, and patients have expressed themselves to me after their return as having experienced little or no improvement. On the other hand, the interior of Florida, the sandy regions in South Carolina and Georgia, away from the coast, during the Winter months, often manifest a prompt influence upon the nasal and bronchial secretion. A stay of at least two weeks is necessary before the patient can be safely trusted to return home. I have, however, frequently observed where the time has been limited, and the patient obliged to return North, after a short stay on the Florida East coast, with perhaps no improvement in the amount of nasal discharge and expectoration, that the return under these circumstances to the more stimulating Northern air is followed by immedate improvement. Patients may be sent North, moreover, during the Winter, if the acute symptoms have entirely subsided, and, if time is limited, are more likely under these circumstances, to experience benefit than if they attempted to go to a warmer climate.

The matter of change of climate may thus be briefly summarized: In the early stage of this type of influenza entire rest at home is to be advised. With the subsidence of the febrile symptoms, if time permits, a change to the South, away from the sea coast, is to be recommended, but if a patient has a week or less at his disposal he may be recommended to go to a higher, drier region, farther North.

With reference to treatment of the persistent cough, after the subsidence of the acute stage, I have found little benefit from sedatives, but a marked improvement to occur from superficial

cauterization of the granules in the pharynx. The patient is often able to point with exactness to a single granule as the source of the uncontrollable tickling, and this may be touched with crude carbolic acid with immediate relief. It often happens, however, that on the following day a granule in the vicinity, or on the other side, is complained of and requires cauterization. The carbolic acid should be applied carefully to the granule, and not to the mucous membrane in the vicinity.

A consideration of these cases renders it probable that the infecting agent enters the mucous membranes through the lymphoid tissue of the pharyngeal follicles, or of the tonsils, or of the adenoid, and the preventive treatment of this condition has, therefore, suggested itself to me. On theoretical grounds we should expect, if the mucous membrane of the pharynx were deprived of its crater-like granules, and the tonsils made more resistant, that the individual would be able to receive with greater impunity in the mouth the successive volleys of virulent micro-organisms which he continually has to face during the Winter. If it be true, as suggested by Park, that our attacks of influenza are due to the progressive heightening of the virulence of the organism with each transfer, it would seem reasonable to assume that many attacks may be escaped if the individual does not possess loopholes in his most exposed regions through which the organisms may penetrate. I have, therefore, been carrying out systematically during the past two years the obliteration of the pharyngeal follicles, so far as practicable, by strong solutions of silver nitrate. At the same time I have introduced solutions of silver nitrate into the tonsillar crypts where possible, or brushed this reagent over the surface of the tonsil. Where the individual has complained of his nasopharynx as being the primary source of the infection, special attention is given to this region by painting its surface with a weaker solution of the silver nitrate.

The claim of preventing a disease by treatment is not willingly made by any of us, where our etiological and pathological knowledge is as meagre as in the present subject. Yet, since we are struggling to advance our control over disease, it seems to me that we should not be deterred from presenting to the consid-

eration of our fellows any ideas, however insufficiently established, which have been helpful to ourselves, or which carry a promise of assistance to our patients.

Discussion.

Dr. J. E. Newcomb: I belong to the class of cases which Dr. Goodale has described, and I found conditions in Florida exactly as he has stated in getting away from the moist sea coast. I wish to speak of the dryness of a place called Deland. It is a most excellent resort for people under the conditions described, and, furthermore, there is there what is not found in so many Florida places, a good hotel, where you can lead a quiet life. I went there suffering from the sequel of grippe, and in the dry climate of Deland I progressed very favorably, and all my symptoms disappeared. Unfortunately, on the return trip I caught cold and landed in New York in about the same condition as when I left, though that has cleared up since Spring has come on

Dr. W. E. Casselberry: I regret the essayist enumerates various conditions which I conceive to be due not to influenza alone, but to various causes. I can confirm the disproportionately severe spasmodic cough and pharyngeal irritation, which is excited occasionally by acute or sub-acute inflammation of a single lymphoid follicle or a small cluster of follicles, and also the prompt suppression of the irritation by cauterization of that particular follicle. The conditon may, however, be observed not only in connection with influenza, but with any microbic infection of the lymphoid elements of the throat. It is at times difficult to identify the spot or follicle particularly at fault, even though the patient can indicate its immediate vicinity, as it may not appear to be more inflamed than other pharyngeal follicles which, though enlarged, are not producing discomfort. The condition is not identical with the familiar chronic follicular pharyngitis, although it is liable to be acutely superimposed upon, the latter especially when there is a chronic hyperplasia of the chain of follicles behind the posterior pillar, known as pharyngitis lateralis. Respecting the persistency of the nasal symptoms of influenza, one should remember that even though the accessory sinuses may not be affected to the extent of definite acute empyema, yet they rarely wholly escape. The essayist's belief that the course is not abbreviated by treatment does not accord with my experience, for I have been repeatedly struck with the fact that when the patient has perhaps endured the disease for days or weeks before seeking relief a decided amelioration has promptly followed locally applied cleansing and

vasoconstrictor remedies, which hasten recovery by affording a partial vent to the stagnant sinus secretions. For the same reason, when climatic treatment is sought I have found the extreme dryness of the Rocky Mountain region most favorable, as it tends to evaporate the excess of secretion and to facilitate drainage from the sinuses.

Dr. H. L. Swain: Among other conditions which may be causation of trouble, as from coughing and lump in throat, I am as likely to find the lingual tonsil as any other part of the throat. The patient will assure you that you have hit the spot when you make applications to this region.

Dr. J. E. Logan: This is a very interesting paper to me, as it is along the line of some investigations I have been making for several years. As for the causation and the etiology, my experience has taught me to believe that the infectious area is not to be attributed to the conditions in the faucial tonsils, as we are wont to believe. I believe the faucial tonsils are more in the avenues of the digestive tract and infections are less likely to pass into the upper respiratory tract than we are inclined to believe. As far as my investigations have led me, the conditons in the vault of the pharynx which we are so likely to overlook—the little pharyngeal recessi—are but culture beds; there, to a great extent, are located the infections that pervade the upper respiratory tract. You will find there the micrococcus catarrahalis, the staphylococcus, the strepticoccus, pneumococcus, etc., in their various stages of cultivation. I am sure that the cause of these recurrent inflammations is located in this smouldering upholstered mass situated in the vault, which condition previously I did not recognize as a causative factor of any value whatever. I am very glad to hear Dr. Goodale say that the upper pharyngeal tract is the place to look for this bacterial invasion. In the treatment of these conditions, I believe there is only one way to prevent their recurrence, and that is by the removal of the upholstered mass. This I have suggested many times, viz.: that whenever there exists the slightest amount of lymphoid tissue in the epi-pharynx it should be removed, for I certainly believe it to be responsible for a large proportion of the diseases, both acute and chronic, of the middle ear and upper respiratory tract.

As regards the local application of nitrate of silver, I concur in Dr. Goodale's suggestion. I find that the application of a 30 per cent. solution of nitrate of silver to these recessi through the naso-pharynx very effective. I make the application directly to these recessi on either side of the median line. They are

often much deeper than you think. After this I apply a cleansing solution, such as Dr. Goodale has suggested.

Dr. Goodale: The truth of Dr. Casselberry's remarks with regard to cauterization during an acute attack was first impressed upon me when I myself was ill with grippe in Florida, at a place where I was able to get only some crude carbolic acid. It worked very well, and produced only slight discomfort, while the otherwise uncontrollable tickling in the throat was promptly relieved. The use of silver nitrate is to be preferred after the subsidence of the acute symptoms, as the effects seem to be more permanent.

With reference to making applications to the naso-pharynx, it is difficult to reach sufficiently high with the applicator to cover the vault. This may be demonstrated by making an application of collargol, which stains whatever it touches. It is necessary to make a long arm to the applicator in order to be able to reach sufficiently high.

DIAGNOSIS OF PERIDONTAL CYSTS OF THE SUPERIOR MAXILLA.

BY NORVAL H. PIERCE, M.D.

The division of dental cysts into follicular and periosteal (peridontal) varieties has been generally accepted since Magitot[1] made his excellent contribution to the subject in 1872. The follicular variety has its origin in disturbances of development, through which degeneration of the dental sac eventuates. This variety is clinically particularized by the fact that the tooth to which the sac belongs is missing in dentition, unless it be a supernumerary tooth. This variety is rare.

By far the most common variety originates from a peridontitis at the apex of the root of a fully developed but diseased tooth. Micro-organisms gain access to the peridont from the diseased pulp through the root canal. Malusez's epithelial remnants participate in the process, and the end result is a small cyst perched on the apex of the root, which is not infrequently removed *in situ* at the time of extraction. The sac consists of connective tissue which is lined with pavement epithelium. The contents of the cyst vary. In aseptic cysts the contents are yellowish, more or less turbid, and frequently glistening from the presence of cholesterine crystals. If they are infected with pus micro-organisms they become purulent and occasionally foul. The cyst increases until it fills the antrum, and then by pressure atrophy the cavity becomes ectatic, and eventually perforation of the facial or nasal wall occurs.

Up to the time dentigerous cysts become infected or reach a size that produce pressure on the bony walls of the antrum, they produce no symptoms. A case has come to my notice which may be briefly related, on account of its unique interest and suggestiveness.

---

[1]Magitot, Mem. sur les Kystes des Manchous Archiv. Gen. de Med., 1872-1873.

Case 1. Male, aged thirty-nine, had the first molar tooth extracted on account of toothache. Immediately following the extraction there followed a flow of rather turbid, yellowish liquid from the alveolar process. The dentist referred the patient to me. I found an alveolar fistula communicating with a cavity within the antrum, from which exuded a slight amount of turbid, slightly yellowish liquid, which contained a few round cells and some cholesterine crystals. Boric acid syringed in this cavity did not enter the nose, but was emptied out through the alveolar opening—this in spite of considerable pressure being exerted on the syringe. The antrum could be entered by way of the ostium, and liquid syringed through this opening returned through the nose, but not through the alveolar process. The diagnosis of dentigerous cyst was at once apparent. The anterior wall of the antrum was removed and the diagnosis confirmed. The whole sac was ablated, and the patient made a very speedy recovery.

When, however, the cyst fills the entire cavity of the antrum before pressure is sufficient to cause ectasis, considerable difficulty may be experienced in differentiating it from hydrops or empyema, especially if perforation takes place into the nose and secondary infection occurs. However, if the fluid contains cholesterine crystals, the diagnosis of cyst may be made. The moment ectasis occurs, puncture of the walls will clear up the diagnosis at once, whether infection has occurred or not, for the writer holds that no empyema of the antrum can cause dilatation of its walls, much less can a hyprops ex vacuo.

In going over the cases reported in the literature of empyema with dilatation, the opinion is confirmed that these were not empyemas, but dentigerous cysts which had become infected. Where else in the body does suppuration within a bony cavity produce pressure atrophy? It is against the nature of inflammation to do this. On the contrary, inflammation within a bony cavity produces a thickening of the walls, while if perforation occurs it is always preceded by a pioneer zone of hyperemia and infiltration in the soft parts. An exception to this may be found in the osteoporosis of syphilis, but I think in this connection this process may be ignored. Surely, a hydrops of the antrum cannot produce ectasis. Here we have a collection of fluid within the antrum that is due to a negative pressure, a partial vacuum, and when the minus pressure, or partial vacuum, is overcome by the pressure of fluid, the transudate ceases.

Again, in the light of recent investigations, it is highly improbable that we can have a pure hydrops exvacuo without the action of the toxines of micro-organisms. Undoubtedly many cases have been reported in the past as hydrops which were in reality dentigerous cysts. This question has been practically decided by the investigations in the Breslau Dental Clinic, where Pratsch over a series of years has been making observations with a view of settling this question. In not one case did he

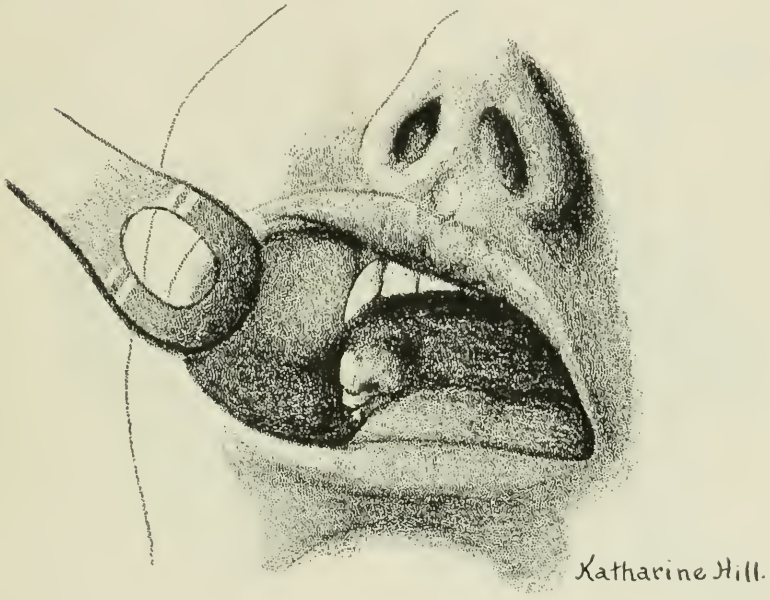


Fig. 1.
Tumor before operation.

find that ectasis due to fluid within the antrum of Highmore was the result of anything but dentigerous cysts.

An important point in the differential diagnosis has been suggested by Gerber, who says that the majority of dentigerous cysts sooner or later impinge upon the nasal floor, and the rhinoscopic picture produced thereby is of diagnostic importance. Here is found beneath the anterior end of the inferior turbinated

body a protuberance which is covered with normally stretched and thin mucous membrane, which gives under pressure the impression of fluctuation. In case of doubt the removal of the facial wall of the antrum of Highmore clears up the diagnosis.

The following case is one of typical dentigerous cyst, which presented itself at the Illinois Eye and Ear Infirmary:

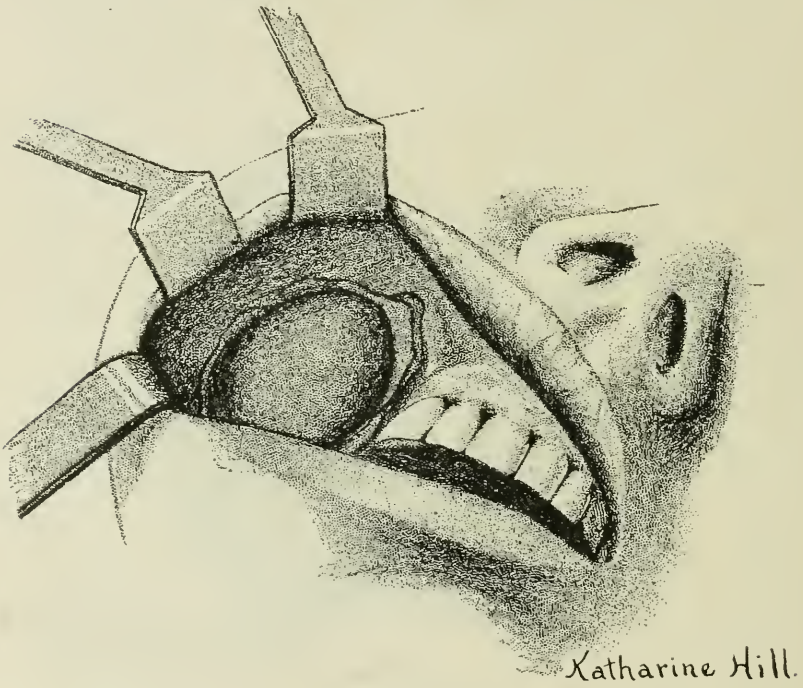


Fig. 2.
Showing external periostral layer reflected from the cyst wall.

Case 2. B. H., male, aged twenty-four, machinist, was admitted to the Illinois Eye and Ear infirmary April 4, 1908, complaining of photophobia and lacrimation in the right eye. The right globe was displaced about four mm. upward in comparison with the left. Fig. 1. He presented a swelling over the right cheek. He first noticed this swelling about one year ago, which increased painlessly until about six days ago, when tenderness first appeared. There was no history of nasal discharge. The first bicuspid was carious. On drawing the cheek outward and

examining the vestibulum oris, a well-defined, smooth, hemispheric swelling is disclosed projecting from the outer wall of the antrum. On palpation the tumor was found to fluctuate in the middle. Surrounding this fluctuating area, which was a little larger than a dime, the sharp edge of the maxillary bone could be felt, which on pressure gave the parchment-like crepitus characteristic of ectasis of the maxillary antrum. Exploratory aspiration revealed a yellowish, turbid liquid, containing few morphological elements other than cholesterine crystals. The nasal examination was negative. Fig. 2.

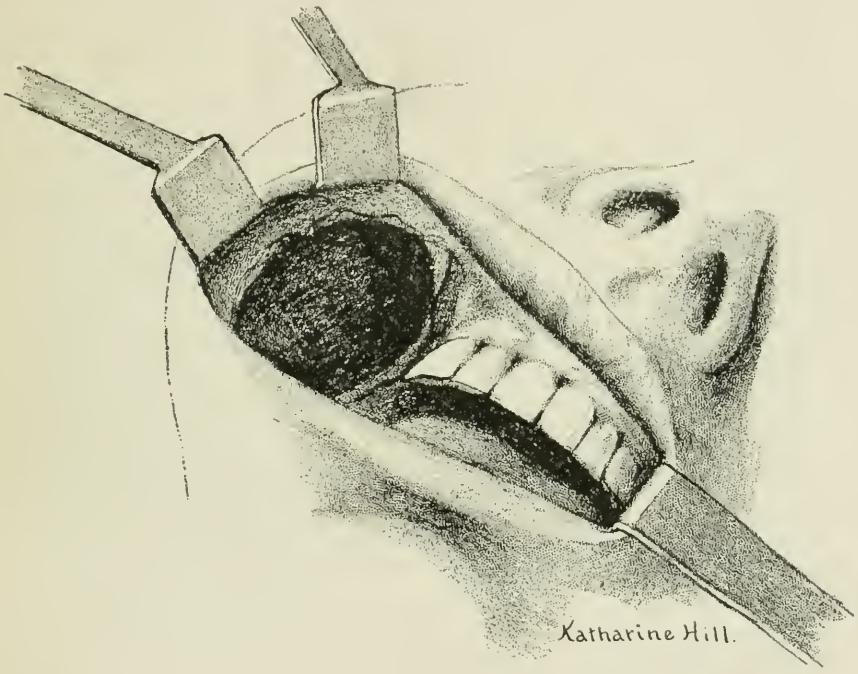


Fig. 3.
Cavity remaining after removal of cyst.

He was given ether and operated on in the recumbent position. A long strip of gauze, about one and a half inches in width, was packed well back between the tonsil and tongue, one end of the gauze hanging out of the corner of the mouth for the purpose of absorbing the blood. An incision was made, which included the fluctuating portion of the tumor and a half inch of

the bony wall of the antrum. This is an important point in technic, for by first elevating the periosteum of the bone we are best able to arrive accurately at the actual covering of the sac.

The cyst, which was removed in toto, was found to completely fill the antrum, and originated from the right wisdom tooth, which was extracted. I could find no opening into the nose. An attempt was made to secure flaps of mucous membrane from the cheek and alveolar process. Fig. 3. These were directed into the cavity by means of stitches, the long ends of which were carried into the antrum and held at some tension by means of the packing of xeroform gauze.

Discussion.

Dr. W. E. Casselberry: Under the title of "Serous Disease of the Maxillary Sinus" I recorded some years ago two cases of retention in the maxillary antrum of a clear, straw-colored serous fluid, one case chronic, bilateral, with nasal polypi and polypoid degeneration of the middle turbinals, presumably obstructing the drainage from the sinuses; the other acute, unilateral, and also affected with nasal polypi. The chronic case yielded serum, never pus, on repeated aspiration at various points through the nasal wall during several weeks, until after the polypi and middle turbinals were removed, when the serum ceased to collect. The acute case yielded serum for a week only, after which it yielded pus. The serum of the first case, on analysis by an expert chemist, contained no cholesterine and there was no bulging of the facial wall. In diagnosis, while the essayist clearly shows that an accumulation of serum in the antrum with bulging of the facial wall can be produced only by a cyst, and that cholesterine is usually present in the serum, we seem still to be without data other than the absence of cholesterin to determine whether a retention of serum without bulging of the facial wall is or is not cystic in origin.

Dr. C. G. Coakley: In reference to dentigerous cysts, their etiology, and the diagnosis in the precystic stage, it is our privilege to see, not infrequently, cases that have pain referred to the region of the superior maxilla. The examination of the nose by any of the methods, including transillumination, proves absolutely negative. There is usually little physical deformity of the superior maxilla, and the only way we have been able to diagnose a case is by having an X-ray photograph with the negative plate placed inside the mouth along the alveolar arch. The in-

formation given by such a plate, where there is disease, is absolutely characteristic. In some cases the teeth are present, and a competent dentist failed to detect any disease of the teeth, yet the plate showed a mass around the root of the tooth, indicating an area of necrosis and beginning cyst formation, sometimes not larger than a pea; operation has found a condition of marked absorption of the bone, with small cystic formation a stage. I have had four such cases this winter, where no ordinary examination could be made of any value whatever. We have had other cases where the X-ray failed to show anything. In the early diagnosis of these conditions, transillumination does not help a particle, and the ordinary X-ray examination, such as is used for sinus diseases, seldom shows the condition. You have to have a special X-ray plate, and the plate in the mouth, in order to get at the floor of the antrum.

Dr. Pierce: I did not exhaustively consider in the paper the follicular variety of dentigerous cyst. The points that Dr. Casselberry mentioned in the paper—the differential diagnosis of hydrops and dentigerous cysts—that is the crux of the matter, whether there is such a thing as hydrops antri, and whether such a pathological condition can produce ectasis. A collection of straw-colored fluid in the antrum may probably result from hydrops ex vacuo, although I believe the question as to whether this can result without the influence of toxins is highly improbable; but again I wish to accentuate the fact that this condition cannot cause ectasis of the walls of the antrum. When the cavity begins to bulge it is not due to the hydrops ex vacuo, but to a dentigerous cyst. In the paper I describe a case in which the extraction of a tooth was followed by a gush of fluid. The patient was sent to me, and I could readily wash out the antrum through the antral osteum—the fluid returned through the antral osteum, and not through the alveolar opening. The diagnosis was complete. The differential diagnosis between empyema and an infected dentigerous cyst may be attended by some difficulty if the case is seen before ectasis has begun. The presence of cholesterin crystals in the fluid would point toward the presence of a cyst.

CASE REPORTS ILLUSTRATING OCULAR AFFECTIONS DUE TO INTRA-NASAL AND ACCESSORY SINUS DISEASE.

BY LEWIS A. COFFIN, M.D.

So much has been written in the past few years on the relation of eye disease to diseases of the nose and its accessory sinuses as to make a general discussion unnecessary, as well as probably boresome and illtimed.

All here, I am sure, are familiar with the writings of Ziem, Onodi, Birch-Hershfeld, Posey Holmes Loeb, et al. Many interesting and instructive histories have been written, and yet from conversation with men working in both fields one comes to the conclusion that even to-day there are many who fail to recognize the dependent relationship.

The following histories are offered in the hope that they may help to convince the disbelieving, as well as emphasize some of the points made by the above-mentioned writers.

Many cases of pain in the head and eye, as well as cases showing visual defect or pathological changes in the eye or its adnexa, have been promised relief by the oculist who were doomed to disappiontment, because the trouble was not in the eye, but in the nose or some one or more of its accessory sinuses. The converted oculist now recognizes the fact that many of these cases are not to be helped or cured without the aid of the rhinologist, and not infrequently before making the attempt at relief by glasses asks the rhinologist if sinus disease can be eliminated.

On the other hand we, as rhinologists, know that many obscure cases, difficult of diagnosis, notwthstanding all our aids, not infrequently present themselves. In many of these cases the ophthalmologist may help us to a mere positive diagnosis by the description of what he finds in the fundus of the eye and the study of the visual fields.

I am in the habit in most of my sinus cases of having the eyes examined. But, as I have said this is to be but a presentation of histories, I have selected four cases, every one of whom first sought the advice and aid of the ophthalmologist, and some of them were for a considerable time under the care of the ophthalmologist before being referred for a rhinoscopic examination.

Mrs. L., aged 27, married, came under my care in the summer of 1908, giving a history of having been under the care of one of New York's leading ophthalmologists for one year, on account of pain in and about the left eye.

Having failed to relieve the pain with glasses, she had been referred to one of our leading neurologists, under whom she had been for several months when she came under my care by "Hobson's choice," I being the only physician in the summer colony where we found ourselves. She was at that time almost a nervous wreck.

On examination the only thing I found which might point to disease of the accessory sinuses was the pain and tenderness on pressure at almost any point where you could bring pressure to bear on the walls of the orbit. There was no nasal discharge nor history of one. I diagnosed disease of some or all of the accessory sinuses, but advised waiting until our return to the city, where an X-ray could be had, as well as better facilities for operation.

The X-ray negative, taken by Dr. E. W. Caldwell, showed distinct cloudiness of all the sinuses, but much more marked on the left side. She was referred to Dr. Frank J. Parker for examinaton of the eyes. From his history, dated October 1st, I take these notes:

"Pain on use of eye. Unable to read but for a short time. Rotation painful in all directions. Left eye painful on pressure. Has had present glasses one year. On examination, fundus normal. Vision, right 20/20, left 20/50. Hypermetropic right eye, compound hyperopic astigmatism left eye."

On October 21st, having promised that there should be no depression in the forehead, I did a partially radical operation on the frontal and ethmoids and a radical in the antrum of the left side. Symptoms for a time only partially relieved. After two

months they were as bad as ever, and to add to the trouble there was a considerable discharge from the nose. The patient became absolutely discouraged, and really to my relief she ceased coming to my office, until one day near the middle of March, 1909, she presented herself with the left eye closed. She was immediately sent to the hospital and told that no promises as to scar depression, etc., would be given. It is enough to say that after a radical Killian the symptoms were entirely relieved. There is practically no deformity or scar, and the little lady says she feels so much better on the left side of her head than on the right that she is sure there must be disease of the sinuses of the right side and is willing on my say-so to have the right side operated. In fact, it is my influence only which so far has prevented operation. On January 13, 1910, she was again referred to Dr. Parker for examination of the eye. He reports as follows: "Right vision same as on November 19. On examination left vision showed 20-30 with plus 1 plus 1.50 axis 150 degrees, an improvement of one line on Snellens' test card at 20 feet."

The two cases following were referred to my clinic by Dr. W. N. Carhart, of Dr. David Webster's clinic at the Manhattan Eye, Ear and Throat Hospital. With the first, a girl of twelve years of age, Dr. Carhart furnished me the following notes:

"When she came to the hospital she complained that for three months there had been pain deep down in the socket of the right eye. Previous to this she had had headache and twitching of the lids of that eye.

"On examination some protrusion of globe was noted. There was no limitation of motion, no tension and exophthalmus was not reduced on pressure. Vision right 12-20, left 20-50. Transillumination showed possible sinus involvement and she was referred to Dr. Coffin. The greater hypermetropia of the right eye may be due to pressure. Field of vision of the right eye restricted."

This case presented no marked symptoms of sinus disease, and I said to Dr. Webster, from whose clinic she came, that I would enter her frontal and ethmoid cavities only at his request

that I do so for further diagnosis and possible help. Dr. Webster so requesting, operation was done on March 9, 1908. The frontal sinus was opened and explored and found to be normal. Most of the anterior ethmoid cells were normal, but about the middle of the ethmoid tract was found what seemed to be one or two cells containing pus and inflammatory granulation tissue. Healing was uneventful and all symptoms relieved. A somewhat better history of her previous condition is found on the hospital records, as follows:

"Trouble began four months ago, cause unknown. Mother first noticed that the child's right eye twitched, especially after she had been reading and after school. About the same time she began to complain of severe pain in the frontal region and in the right eye. Headache most severe in the morning. About the same time the mother first noticed exophthalmus of the right eye. Patient has poor vision, but no diplopia. About the same time the child began to have a thick yellow discharge from the anterior nares," which gradually became less and was nil when she came to the clinic. These cases emphasize the point that nasal findings may be absolutely negative.

With the second case Dr. Carhart furnished the following notes: "Annie B., aged sixteen, factory worker. Iridectomy performed on right eye some years ago which leaves a large leucoma of the cornea due to an old injury. When seen she complained of having had pain in the right eye at intervals for some months, also frontal headache. Right eye somewhat prominent. No tension. Fundus not well seen on account of leucoma. Advised second iridectomy to enlarge the coloboma of the iris. Operation successfully done. Also given correction for slight hypermetropia of left eye. Right eye unimproved by glasses.

"September, 1908, has been using dionie for some weeks with some effect in clearing opacity. Right eye more prominent than one year ago. Pain and headache recurring.

"November 25, 1908, some tension in right eye, which is distinctly larger. Suspect frontal sinus involvement. Referred to Dr. Coffin."

This case showed evidence of sinus disease in the pain, ten-

derness on pressure in the walls of the orbit, and nasal discharge, Transillumination and X-ray. Operated about December 1, 1908. For a time pain was relieved. The exophthalmus has been entirely relieved, except for a very short time once or twice since the operation the eye has seemed to protrude a little.

One month after the operation most of the symptoms returned and I again opened the frontal and ethmoid sinuses. I found a necrosing area in the posterior wall of the frontal sinus. Curetted to a considerable depth, but did not uncover the dura. Broke through the septum between the two frontal sinuses at its top. Did not in any other way open the left frontal sinus. Healing uneventful. Considerable depression over the site of the right frontal sinus.

This patient never has ceased to have more or less of a purulent discharge from the right nostril, and from time to time granulation tissue springs up about the opening into the sphenoid. The patient is seldom free from pain on one or the other side of the head. She gives me the impression of liking to be worked over, even to major operations, so that I am afraid that, do as much as I will, she always will have trouble. The most troublesome case I ever have had, and the only case that today I do not consider satisfactorily cured.

The fourth case is that of a young Sicilian girl, fourteen years of age, referred to me by Dr. Creigler, of Drs. Hepburn and Oatman's clinic. She was referred to me about the first of December, 1909. Dr. Creigler sent me the following notes:

"Said Fortune, age fourteen, a native of Sicily, presented herself at the Manhattan Eye, Ear and Throat Hospital on the 12th of November, 1909, for the relief of what she thought to be an inflammatory condition of the left eye. No accurate history could be obtained, owing to her ignorance and peculiar dialect, except that six months previously pain, photophobia, increased lacrymation, swelling of upper and lower lid with marked redness of the ocular and palpebral conjunctiva developed, together with a muco-purulent discharge from both nostrils, which excoriated the nasal passages as well as the upper lip. The

nasal discharge, however, did not develop for one month after the eye symptoms appeared.

In the course of a few weeks the above symptoms subsided and the patient did not seek aid until a recurrence of the same symptoms in a more aggravated form. When she presented herself at the hospital the following condition was noted: moderate inflammatory oedema of both lids of the left eye, but more pronounced in the upper.

Palpebral conjunctiva very markedly injected and thickened; ocular conjunctiva likewise very much congested. There was a cellulo-vascular infiltration of the outer layers of the cornea in the upper quadrant. Lacrymation was quite profuse and the eye very sensitive to light. There was no involvement of the iris or other deep structures of the eye so far as could be made out. The discharge, though not abundant, was of muco-purulent character with a preponderance of the mucoid element.

There was no involvement of the lacrymal apparatus.

Pressure over the antrum and over the frontal sinus did not elicit pain, but the irritating nasal discharge gave evidence of some disturbance in that region. A smear taken from the superior fornix was examined by Dr. Zabriskie and a negative report rendered. No cultures were made.

As the eye symptoms in this case so closely resembled those of acute trachoma, the patient was kept under observation until November 24, at which time there was no change in the eye symptoms, and although there was no pronounced tenderness over the antrum or frontal sinus, there was a slight puffiness of the left side of the face.

The case was referred to me for an opinion as to the condition of the sinuses. I found the conditions as described by Dr. Creigler except that there was considerable tenderness on pressure on the roof of the orbit. The child said she had never suffered from headache. The lid was red and excoriated and the discharge had piled up in clay-colored flakes on the upper lid. She was referred to Dr. Caldwell for radiograph. Dr. Caldwell called me on the 'phone and asked that I come to his studio to view the picture, as to him it was rather peculiar and unsatis-

factory. It was not a convincing picture and she was sent for another exposure. In the meantime I had decided to operate anyway, and did so without waiting to see the second negative.

A radical exenteration of the ethmoids was done through a curved incision about the inner canthus of the eye and the entire floor of the frontal removed. There was a large supra-orbital ethmoid cell containing a partially filled muco-cyst—a cyst that was draining into the nose. The bones of the region were soft and the floor of the frontal was partially absorbed so that there was communication between the frontal and ethmoid cell. The entire lining of the frontal was picked out of the sinus as easily as it could have been from water. In fact, it seemed to be bathed in a peculiar watery fluid.

Abundant granulation tissue was found throughout the ethmoid tract and in the sphenoid. The antrum was not opened at this time. Specimens from the various operated regions were sent to the laboratory and Dr. Jonathan Wright reported as follows:

1 (which was taken from the anterior ethnoids). "Oedematous mucosa containing some products of chronic inflammation."

2 (taken from the sphenoid). "Oedematous granulation tissue."

3. "Lining of frontal sinus oedematous, but otherwise fairly healthy mucosa, except that it contains some structureless bodies of unknown nature."

After this operation the patient ran a temperature for several days ranging from 100 to 102, after which it subsided to from 99 to 100. On the 27th of December I opened the antrum. It was full of pus, the lining membrane oedematous and polypoid.

This patient after discharge from the hospital returned once or twice to the clinic much improved, but ceased coming before the oedematous swelling of the lids had entirely disappeared. The conjunctiva, however, was normal and photophobia relieved.

The following case was referred to me by an oculist for a radical operation on the antrum, as he said he had washed it out daily for some time without apparent benefit. I suspected disease of all the sinuses of the right side and sent her to Dr.

Caldwell for a radiograph, which showed my suspicions to be well founded. She was admitted to the hospital for a Killian

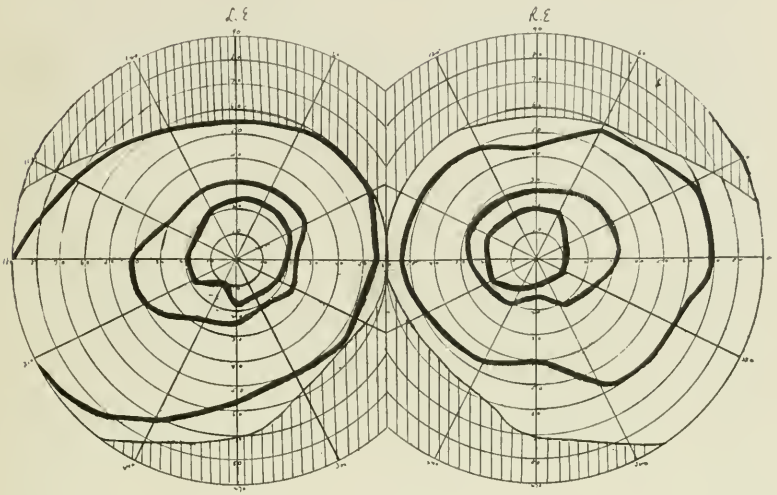


Fig. 1.

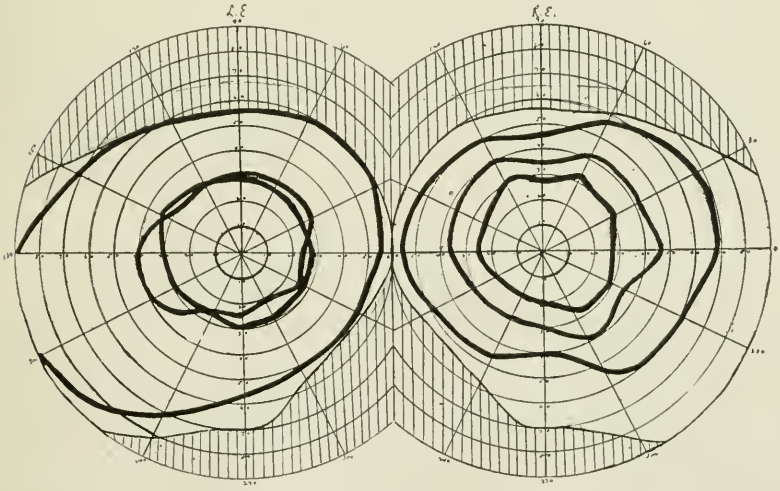


Fig. 2.

operation on January 31. Her catarrhal symptoms and headache had been of three and one-half years duration, during which

time she had noticed that type became blurred after reading but a few minutes, and at times she saw double.

Dr. Parker examined the eyes on January 28 and reported as follows: Optic nerves of both sides very pale on temporal side and slightly woolly on the nasal side. The color fields were as shown in Fig. 1, which shows all fields contracted—the right more than the left.

On February 23, twenty-three days after operation, the fundus showed marked improvement in the nerve, and the fields were less contracted as shown in Fig. 2, the fields for white remaining the same, the fields for red and green considerably larger.

This case interested me, not only on account of the apparent dependent relationship of the eye and sinus disease, but it showed to me that possibly in a study of the visual fields we might find another aid in diagnosis.

Dr. F. J. Parker kindly offered to chart the fields of any patients whom I might send him. The time has been too short to allow me to draw conclusions, but certainly there is much of interest in the study, and I feel that in many cases at least we may receive positive help in diagnosis.

a. Dr. Ziem, in 1892, reported concentric contractions of the visual fields due to collateral stasis originating in the swollen mucous membrane, which, he adds, is easily understood when one recalls the extensive anastomosis between the vessels of the orbit and bulbus on the one side and those of the nose on the other.

b. Hajek, in a paper published March, 1910, asks:

"How do we explain the inflammation of the optic nerve in simple empyema or hydrops of the sphenoid with no direct progress of the disease itself," saying that in his own case a direct extension is excluded as the inner wall of the sphenoid showed no inflammatory changes, and further than an inflammatory process would not subside in half an hour, and explains it as a release of the circulatory disturbance. He further states: "In cases of empyema of the sphenoid with optic neuritis, upon opening of the cavity and release of the pus there is almost immediate retrogression of the neuritis."

I question this being a proper use of the word neuritis.

c. Prof. Dr. Albert Rosenberg (Berlin) and Dr. F. L. Braun

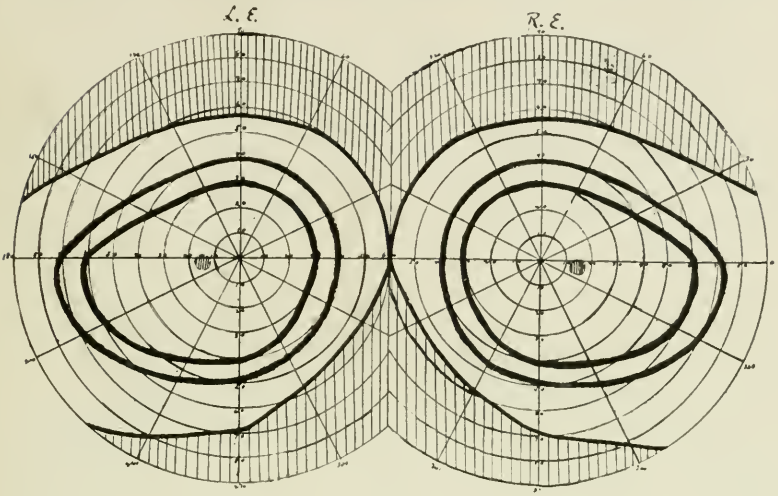


Fig. 0.

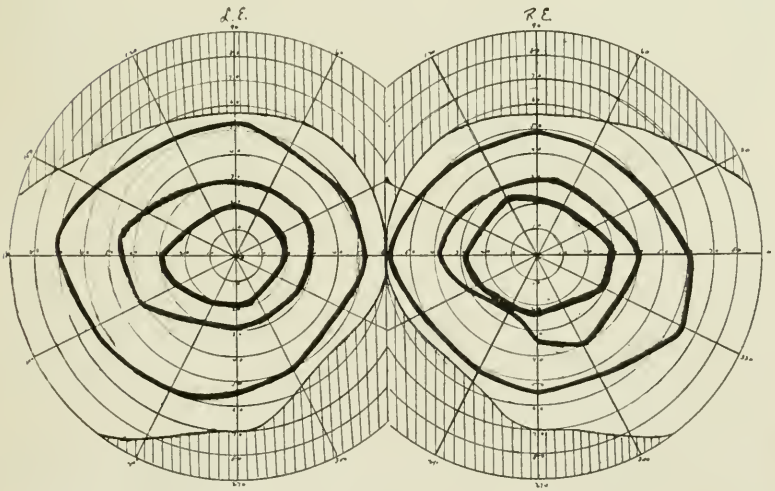


Fig. 3.

report the opthalmoscopic examination of 40 cases of accessory sinus diseases and report:

20 cases of circulatory disturbances.
16 cases venous engorgement.
1 case choked disc.
5 cases hyperaemia.
3 cases in which edges of disc were blurred.
8 cases of pallor of disc.

They report the frequent concentric contraction of the visual fields, especially in the field for red; this they found in 14 cases; in only 3 were the fields for white contracted.

d. Dr. Ernst Huber reported in 1907 a case operated in December, 1906, for the relief of an empyema of the ethmoid and sphenoid sinus in which were evidences of optic neuritis and fields for color contracted. In March, 1907, three months after operation, the fundus and fields were normal.

There probably are physiological variations in the normal fields of vision. Again, they will vary taken under varying conditions, such as light, fatigue, etc. I shall show you the field charts and radiographic pictures of eight patients, with few remarks and no conclusions, but as we propose to continue the work we shall hope to offer some deductions at a future time. In the meantime I shall be gratified if others will investigate along similar lines.

Figs. 1 and 2 have been shown in connection with history of last case.

Fig. 3 shows the fields of a young man twenty-one years of age who presented himself at my clinic at the Manhattan Eye, Ear and Throat Hospital on March 27, 1910, on account of pain in the head and nasal discharge. Diagnosis of pan sinusitis was made, and he was referred to Dr. Caldwell for radiograph, and to Dr. Parker for the charting of the fields. Dr. Parker reported the retina and nerve normal.

The fields, as you see, are concentrically contracted, and the X-ray negative shows a pan sinusitis with the possible exception of the right antrum. Case referred to Dr. Samuel McCullagh, who is still working on him.

The figures show the visual fields for white, red and green, named in the order of size, except in Fig. 7, in which there is an

inversion of the red and green—at least, the field for red is so contracted as to be well within the green. Fig. 0 shows the normal fields for white, red and green.

Fig. 4 shows the fields of a young woman twenty-three years of age who came to the hospital on February 26, 1910. Always catarrhal, adenoids and tonsils removed six years ago, Ireland. Left middle turbinated removed three years ago. Has constant and severe headaches and always feels as though she had cold in the head, but very little discharge. Referred to Dr. Roof, who, on examination, brought her back to me to ask

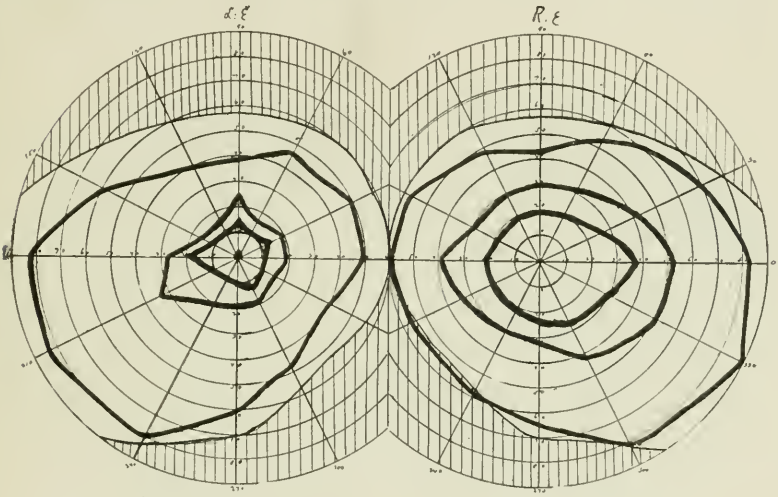


Fig. 4.

if I thought the tumor-like body on the left side of the septum was the middle turbinated in adhesion with the septum. I thought it was.

Dr. Roof removed a portion of the lower edge when the middle turbinal was seen behind. I did a sub-mucous resection of the septum and found the tumor to be due to an osseous metamorphosis of the cartilage so thick and dense that I was unable to cut through it with a Jansen forceps.

Dr. Parker, to whom she had been referred, reported that she complained of fatigue of one eye and occasional blurring on use.

Retina was normal except for enlarged veins. The fields had already been taken by a house officer. They showed such marked contraction that Dr. Parker took them himself. They were the same as reported by the house officer and as shown in the chart before you.

Fearing that the eye symptoms were due to the intra-nasal conditions, I referred her to Dr. Caldwell for proof, which was not forthcoming. As you see from her negative, there is a considerable involvement of the sinuses, especially on the left side.

She said she felt entirely relieved after the intra-nasal work and ceased coming to the clinic; I have failed to find her.

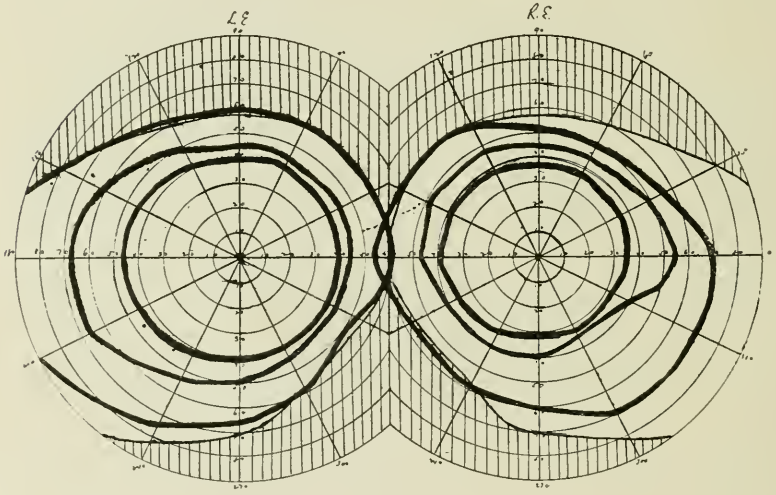


Fig. 5.

Fig. 5 shows the fields of a young girl seventeen years of age. Complains of headache and vertigo every day for two years. Four changes of glasses without relief. General health good. The patient had no discharge from the nose when she came to the clinic. Dr. Parker reported retina and vision normal except for the exceedingly large veins, which he said were the most distended he ever had seen. On February 23 removed a very large cystic middle turbinated from the left side. On March 15 headaches gone. Veins of retina normal; fields the same.

Since this have exenterated ethmoids with Ballinger's knife. Patient feels perfectly well as to head, but fields remain as before. Negative shows involvment of ethmoids and septum of left side.

Fig. 6 are the fields of a young domestic twenty-three years of age. They show concentric contraction of color fields of right eye with white normal, while the left shows concentric contraction of all fields. Vision in right eye 20-40, and in left eye 20-30, which shows the greater contraction in the better eye. She came to the clinic on account of headache and discharge from the nose. Her negative shows but one frontal, the left

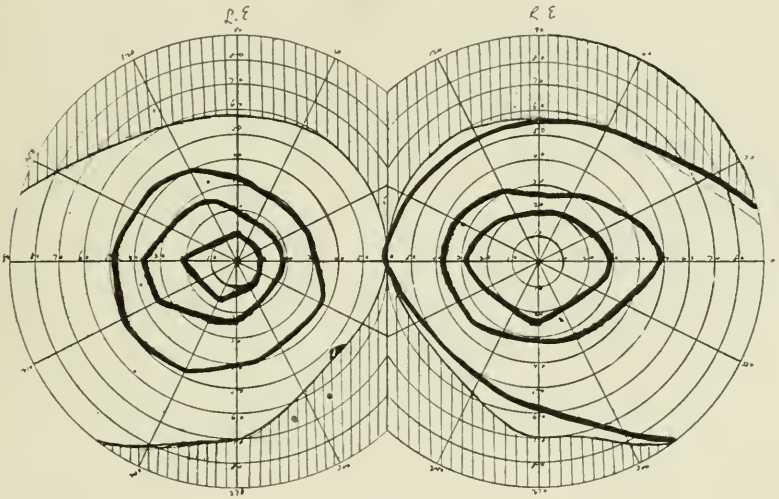


Fig. 6.

fairly clear, but shows involvment of all the other sinuses, showing more marked involvement of the sphenoid on the right side.

The patient probably got tired of it while we were getting ready to treat her and disappeared.

Fig. 7 shows the fields of a young man nineteen years of age, having the most extensively diseased ethmoid and sphenoid I have ever seen. The fields are interesting on account of the extreme amount of red, causing it to look like an inverted field. Inverted fields are generally regarded as due to brain tumors or

hysteria. This young man has no symptoms of brain tumor and he certainly does not impress one as being hysterical. The fields have been taken both by Dr. Oatman and Dr. Parker, Dr. Parker having taken them several times. I have done a radical Killian on both sides as well as a radical antrum operation. His first operation on the left side was on April 1, and the second on the right side on April 2. His fields of right eye on the 26th were the same as before April, but he felt too weak to stand the strain for a long examination and the work was not thoroughly done.

His X-ray negative will speak for itself.

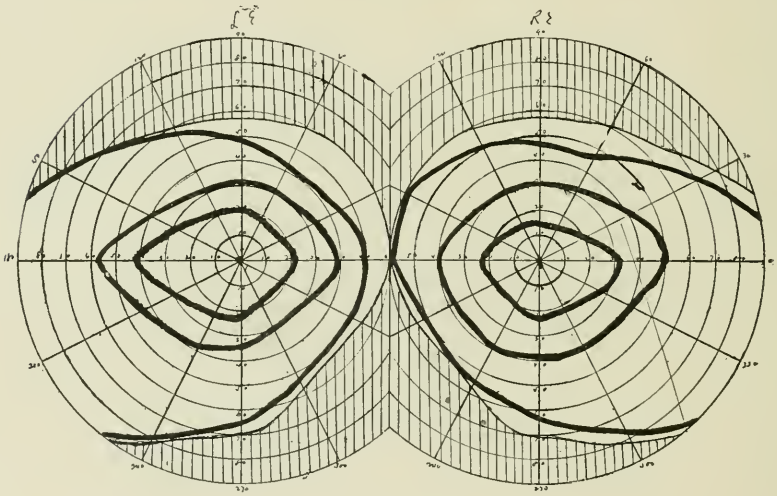


Fig. 7.

Fig. 8 shows the visual fields for a man of particularly good vision at fifty-three years of age, who for the past year has suffered greatly from headache, so much so as to be obliged to give up his work. I have known him for years as a patient and friend, and had not suspected intra-nasal or sinus disease. Under advice he left the city for several weeks on account of his headaches, but returned no better. I asked Dr. Parker to take his fields, and on this showing sent him to Dr. Caldwell. Dr. Caldwell thought he had involvement of several of the sinuses.

especially of his left antrum. Dr. Coakley saw him with me and we agreed that probably any cloudiness of the plate might be due to the very thick, bony walls of the sinuses. All sinuses dark on transillumination. We thought some relief might come from removal of the left middle turbinated which was in contact with the septum. On a further study of the X-ray vization, there appeared to me to be undoubted involvement of some of the ethmoids of the left side, especially those about the orbit, as you will see by looking at the plate. I have removed the turbinated and broken down some of the ethmoidal cells. The patient is much improved and improving.

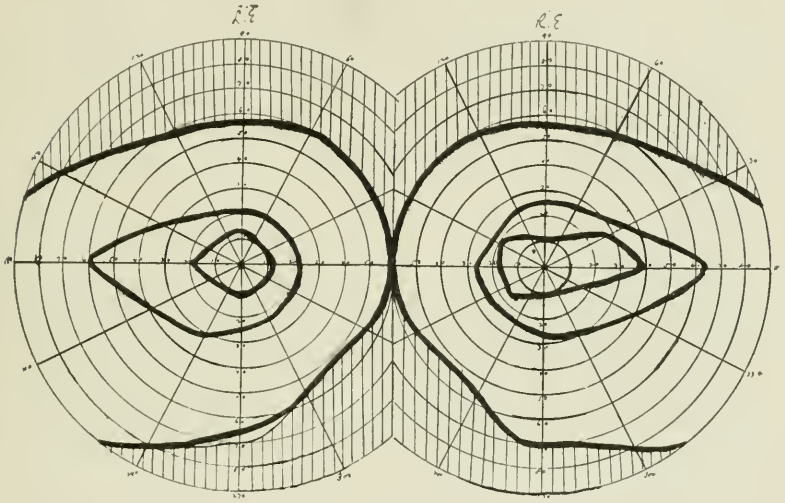


Fig. 8.

References.

Hansell, H. F. Orbital Complications of Diseases of the Frontal Sinus. (Ann. of Otol., Rhinol. and Laryngol. June, 1909.)

Posey, W. C. Paresis of a Levator Palpebrarum Occasioned by Frontal Sinusitis. (Old Dom. Medical Journal, April, 1909.)

Grant, D. Recent Discussions on the Nasal Access. Sinuses in Relation to the Optic Nerve. (Jour. of Laryngol., Rhinol. and Otol., May, 1909.)

Knapp, Arnold. Ocular Complications of Nasal Sinus Dis. (Am. Journal of Med. Sciences., July, 1909.)

Murphy, J. W. Relations of Disease of Access. Sinuses of the Nose to Eye Symptoms. (Ohio State Medical Journal, January, 1909.)

Pierce, N. H. The Anatomical Relationship between the Access. Nasal Sinuses and the Orbit. (Jour. Ophth. and Oto-Laryngol., February, 1909.)

Posey, W. C. Some Ocular Symptoms of Diseases of the Nasal Accessory Sinuses. (Ann. of Otol., Rhinolog. and Laryngol., June, 1909; Old Dom. Jour. of Med. and Sur., November, 1909, and Jour. of Ophth. and Oto-Laryngol., December, 1909.)

Risley, S. D. Optic Neuritis Associated with Disease of the Nasal Accessory Sinuses. (Jour. Nerv. and Mental Disease, May 1909.)

Onodi, A. Visual Disorders Due to Inflammation of the Frontal Sinus. (Orvosi Hetilap, No. 22, 1909.)

Turner, A. L. The Orbital Complications of Suppuration in the Frontal and Ethmoidal Air Sinuses. (Edin. Med. Journal., May, 1909.)

Gutmann. Bilateral Orbital Cellulitis, Bilateral Thrombosis of the Ophthalmic Vein and Sinus Cavernosus after Empyema of the Sphenoid. (Zeitschrift f. Augenh., Band 21, Heft 1, 1909.)

Hajek. Acute Empyema of the Sphenoid with Exophthalmos: Endonasal Opening. Cure. (Zeitschrift f. Laryng., Rhinol. u. ihre Grenzgebiete, Bd. 1, page 629, 1909.)

Sagebiel. Empyema of the Sphenoid, Thrombosis of Cavernous Sinus, Defect in the Lamina cribrosa, Exitus. (Zeitschrift f. Ohrenh. u. f. Kr. der Luftw. Bd. 58, page 129, 1909.)

Gyergyai, A. V. Successfully Operated Case of Suppur. of the Maxillary Sinus with Orbital Complications. (Orvosi Hetilap., No. 2, 1909.)

Onodi, A. Oculo-Orbital, Intracranial and Cerebral Complications of Diseases of the Nasal Accessory Sinuses. (The Laryngoscope, Nov., 1909.)

Ziem. Intra-Ocular Complications of Diseases of the Nasal Cavities. (Munchener Medizienische Wochenschrift, April, 1892, page 267.)

Hajek, M. Mucocele of the Sphenoid, Optic Neuritis, Operation and Cure. (Monatschr. f. Ohrenh. u. Laryngo-Rhinologie, March, 1910.)

Rosenberg, A., Baum, F. L. Diseases of the Nose and Eye. (Zeitschrift f. Laryngol., etc., Bd. 1, Heft 4.)

Halasz, H. A Contribution to the Literature upon Eye Complications of Tumor Formations in the Sphenoid. (Read before the International Congress at Budapest, Section 15.)

Swerjewsky, Von L. (Charkow). The Relation of Nasal Trouble to Diseases of the Eye. (Russische Monatsschrift f. Ohren, Nasen u. Halskrankheiten, 1909, Nos. 8 and 9.)

Baumgarten, Egmont. Visual Disturbances Caused by Diseases of the Nose. Orvosi Hetilap, No. 51, 1909.)

Adam, Kurt. Purulent Inf. of the Accessory Nasal Sinuses in their Relationship to Diseases of the Eye. (Medizienische Klinik., 1909, No. 46.)

Huber, Ernst. Intra-orbital and Intra-cranial Complications in a Case of Bilateral Ozena with Purulent Discharge. (Monatsschrift f. Ohrenh. und Laryngo-Rhinologie. Bd. 16, Heft 10, page 549, 1907.)

Snellen, H., Quix, T. H. The Relation of Optic Nerve Lesions and the Post Nasal Sinuses. (Monatssch. f. Ohrenh. u. Laryngo-Rhinologie, December, 1909, page 892.)

Schmiegelow, E. A Contribution to the Relation of Diseases of the Nose and Eyes. (Fraenkel's Arch. of Laryngology.)

Thomas, St. Claire. Causes and Symptoms of Thrombosis of the Cavernous Sinus. (Zeitschr. f. Laryngologie. Bd. 1, Heft 4.)

Discussion.

Dr. F. J. Parker (by invitation): I merely wish to emphasize a few points. I have had the privilege of working with Dr. Coffin, and have taken all these fields with the self-recording perimeter under the best conditions of daylight. The discs used were ten millimetres square. I am confident that the fields are accurate; many of them were taken several times, and they were also taken by the house surgeon; few, if any, errors were found, and these were very slight. There is a physiological error in perimetry of 10 or 15 degrees, but there is no such variation as is found in these charts, especially in color. A line of work of this sort will be a great help to the ophthalmologist. We ophthalmologists see a class of cases that drift from one to another and we cannot make them comfortable with glasses. Two of these were just such cases. They were normal with the ophthalmoscope, but a study of the visual fields gave us new ideas as to the source of the trouble. There is a class of cases with optic atrophy, and it has been almost a rule with us that if we can find no reason for the condition we put the patient on iodides. I believe that many of these cases that have had their digestion injured by potassium iodide have been due to sinus disease, especially of the ethmoid and sphenoid. I have a case which has not been seen by Dr. Coffin, of a surgeon in New York who, after an attack of influenza, had trouble in his antrum.

After being relieved, he came to my office complaining of his eye. He had very much reduced vision with one eye. I found the fundus normal and took his field and found marked contraction for colors, and also a marked scotoma. The next day he came in with optic neuritis and increase of scotoma, and he was sent to Dr. Cutler, who confirmed my findings and suggested that the patient go to the hospital. The rhinologist examined and reported enlargement of the middle turbinate only. We suggested an exploration, which was done, and pus was found in the ethmoid. The condition increased with such rapidity that the man was nearly blind in a few days. Then a third operation was done and the sphenoid was found to be filled with pus and granulations. Following that operation there has been a return to normal conditions, and a few weeks ago he had only a small central scotoma and the contractions of the field were less.

Some of these cases of Dr. Coffin did not have sinus trouble but had intranasal swelling of the turbinates, etc., with a normal optic nerve. I feel that these cases should be put into two classes: One due to circulatory disturbances, and the other due to perineuritis, causing swelling and beginning optic atrophy. These cases show first in the peripheral fields, where the visual acuity is less in the normal eye. I hope the men will work along this line. Dr. Coffin and myself are anxious to find its value in diagnosis. Up to the present time we feel that it is of great value.

Dr. C. G. Coakley: I did not hear Dr. Coffin's paper, but he has told me of his investigations and I presume that the question of the visual fields is one of the points of his paper. Two months ago I had under observation three cases of sinus involvement, and I had them examined by Dr. Wheeler. In none of these three cases was there any contraction of the visual field. Then we had another case recently with a marked unilateral involvement, and both Dr. Parker and Dr. Wheeler examined it, and in that case also there was no change in the two fields of the eyes—they were practically normal; so that while this condition undoubtedly occurs in some cases, we are just at the beginning of the subject. I propose to go on and investigate it, and probably later on we will find a class of cases in which this condition will be found.

Dr. H. L. Swain: I wish to give my personal word of thanks to Dr. Coffin for his resume, which we have had presented to us in such a manner that we have gathered much more than from reading about what he is doing in this line of work. We have also had the help of Dr. Parker's illustrations and explanatory remarks which have thrown light upon the subject that we could not otherwise have received. I have recently been studying

what Onodi has to say in regard to the relation of the optic nerve to the walls of the sphenoid and the posterior ethmoid sinuses, and I feel that we are almost open to censure that we have not made more of this long ago. After contemplating such plates as those of Onodi it does not seem any wonder that the optic nerve becomes involved; the wonder is that it ever escapes when there is serious pressure inside of these cavities.

Dr. Coffin: Dr. Coakly expresses that which I wished to say, that this is but a beginning. No definite conclusions have been drawn. We are going on with the work and shall hope to work out something of interest and worth. I have not so far found a case that has been positively diagnosed as having disease in the ethmoid or sphenoid that has not shown a contraction of the visual fields apparently relative to the sinus involvement. Dr. Sluder's case was probably due to a circulatory stasis, a condition existing probably in a majority of these cases, the effect on the optic nerve being produced probably by the pressure from the over-distended veins—a condition entirely different from a toxic neuritis—a differential symptomatology of these two conditions developed by the joint work of the oculist and rhinologist is practically the end to be attained by work along these lines.

THE CUTTING IN TWO OF A LARGE STEEL PIN WHILE TRANSFIXED IN THE LEFT BRONCHUS AND ITS REMOVAL BY LOWER BRONCHOSCOPY.

Exhibition of a Bronchoscopic Pin-cutter and Fragment-holder, Devised to Meet the Emergency.

BY W. E. CASSELBERRY, M.D.

The conditions which result from secondary infection, bound to occur in time at the site of a foreign body, which remains unrecognized or unremedied in the broncho-pulmonary tract, must often have been mistaken for primary tuberculosis or other initial disease; for instance, a chronic pulmonary abscess, menacing to life, eluded all efforts to establish its cause until the sudden expulsion by cough of a spicule of bone, which was followed promptly by healing of the abscess. But, that secondary infection may be delayed for weeks or months, with little or no suffering, provided the foreign body be of narrow calibre, non-obstructive and non-absorbent, was notably evident in connection with the glass-headed, 1½-inch, very sharp, black steel pin which lodged, in part, at the bottom of the left bronchus and, in part, within the first bronchial branch of a fifteen-year-old girl. In this position the pin had remained undisturbed and undisturbing for a period of ten weeks, having caused during only the first week or two mild coughing spells with sensations of pin-prick and slightly blood-stained expectoration, symptoms which merely encouraged the family to hope that the pin would be coughed up, while afterward the absence of suffering encouraged the thought that it probably had been coughed up. Freedom from suffering for so long a period naturally leads a patient to forget, or at least to doubt the continued presence of a foreign body, and as the physical signs are apt to be equally indefinite, it is only since the discovery of the X-ray, supplemented now by bronchoscopic

inspection, that a means of positive demonstration has existed. Two delusions, however, in the interpretation of the radiographs, taken after a physical examination at the end of the ten weeks had failed to elicit any definite signs upon which a diagnosis could be based, will serve to remind us of the shortcomings of the X-ray and to accentuate the need as well as availability of direct observation through the bronchoscopic tube for orientation of the foreign body in position and for establishing its pre-

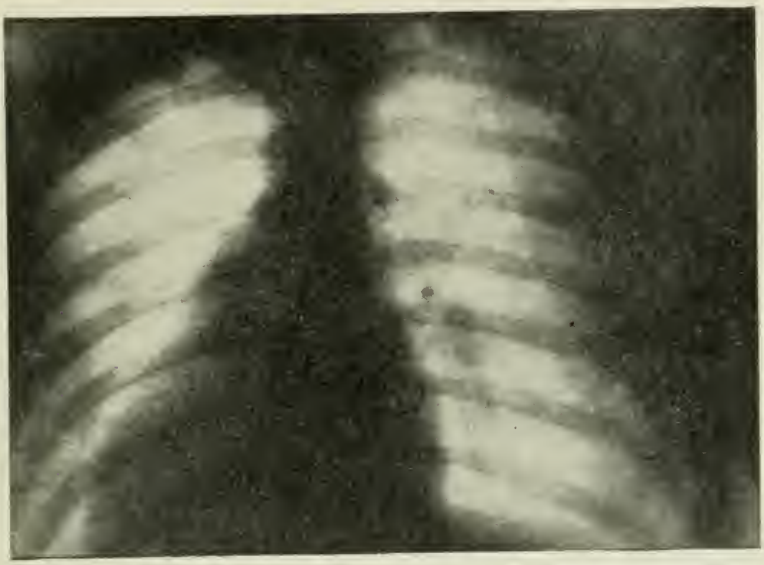


Fig. 1.

Vertical false shadow, "very like a pin" on the right side, the real shadow being on the left side, obscured by the sixth rib. (Exposure with plate behind.)

cise conditions before one can feel assured of its ready removal. One of these delusions concerned a false shadow on the right side in the first X-ray plate, a shadow "very like a pin," so much so that it was, for a time, mistaken by every one; whereas, the pin was lodged on the left side, its real shadow being visible but obscured in the shade of the sixth rib. (Fig. 1.) The other delusion resulted from the idea conveyed by the radiograph of a greater than the actual depth of location of the pin in the

bronchi, a fallacy due to difficulty in realizing that the sixth intercostal space at the back, the site of the pin shown in the radiograph, is on a plane not deeper than that of the third rib in front (Fig. 2), and that the bottom of the bronchus at the site of its first branch, where the pin was found, corresponds to the same plane. Notwithstanding comparative measurements, I was expecting to meet with the pin lower down in the bronchial tract.

"How it happened" is worthy of comment in order that women

Fig. 2.

Showing the pin in the left sixth intercostal space at the back, on the same plane as the third rib in front, and at the same level as the first bronchial branch, where the pin was found. (Exposure with plate in front.)

may be warned against a certain habit while dressing, for the pin had dropped so easily and naturally into the bronchial tubes, lodging where its transfixion by the impact of cough was inevitable, that one must regard it as an accident liable to repetition.

The young woman, with pin in mouth and skirt in hand, in

readiness to drop the skirt by encircling it over her head, raised very high her outstretched arms, an act which is identical with the first movement in Sylvester's method of resuscitating suffocated persons, a method which owes its power to the fact that raising the arms forcibly expands the lungs and causes an inrush of air, the mouth opening itself as if by instinct; and, at the same moment, in readiness to let the skirt fall clear of her hair, the head was thrown backward and face upward, an attitude which is identical with the sword-swallower's position, so called because it brings the mouth, larynx and windpipe into a straight vertical line. The pin, let loose by the involutionary parting of the lips, simply dropped with the air current head foremost straightway into the left main bronchus, and on downward till its head and two-thirds of its stem had passed into the first bronchial branch, where that much of it became hidden from bronchoscopic view in the upturn by which this branch is given off to supply the upper lobe. The pin, being too long to quite make the turn, was arrested, evidently with its head compressed against an upturning segment of the bronchial branch. The point carrying one-third portion of the stem, which alone remained exposed to bronchoscopic view, projected from the orifice of the branch diagonally upward across the rear segment of the main bronchus, its end impinging against and its point inserted into the wall of the bronchus (Fig. 3).

The precise location of the pin, with the fact of its transfixion, was first ascertained only by upper bronchoscopy at the first operation, an operation which, though it failed for the moment to remove the foreign body, fulfilled its avowed alternative purpose, to obtain information which would enable one to remove the pin at a subsequent operation, and without which the plan of cutting the pin in two could not have been formulated. Both ends of the pin being up against a barrier explains how, by the impact of cough, the pin-point had been driven so firmly into the bronchial wall and why the repeated efforts at the first operation to displace the pin should have failed.

I need not particularize the first operation except in so far as these efforts to displace the pin tend to show the actual necessity for cutting it. A skilled first aid, Dr. G. P. Marquis; an expert

anesthetist, Dr. Herman Peterson; an excellent mechanician, Mr. V. Mueller, suitable hospital facilities at St. Luke's and approved appliances were all at hand, the patient's head being satisfactorily held in the Boyce position by Dr. E. W. Bodman. Tubes of the Brunig-Killian and Jackson types were passed

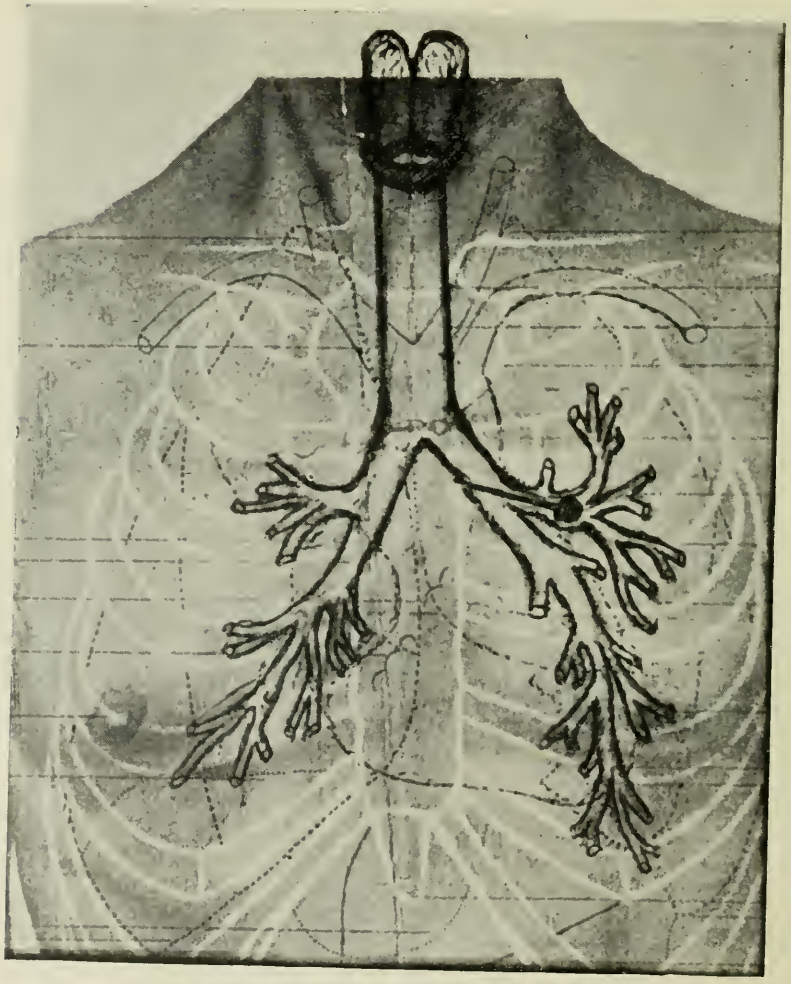


Fig. 3.

The transfixed position of the pin in relation to the bronchial tree (Jackson) and to the thorax (McClellan).

by the mouth through the larynx and downward, the first one, inadvertently, being passed over and beyond the pin, which rather hugged the back wall of the bronchus, but on withdrawing the tube somewhat, the exposed third of the pin came plainly into view. No difficulty was encountered in repeatedly grasping the pin through the tube at a depth of about eleven inches with various bronchoscopic forceps, the grasp being renewed to change forceps or the vantage point of its grip no less than twenty times in order to apply leverage and reasonable force in every promising direction; but all without avail, other than a spontaneously uttered conviction on giving it up for the time that it must first be cut in two.

Among the multiplying number of foreign bodies in the bronchial tract which are now being brought to light through the efficiency of the bronchoscopic methods introduced by Killian and advanced by Jackson, Ingals, Coolidge, Mosher and others, it is probable that additional cases complicated by transfixion will be encountered; hence I propose, as a general principle, the plan adopted in this case, of facilitating the bronchoscopic extraction of immovably transfixed pointed objects, such as pins, needles, and perhaps open safety-pins, by first dividing them, via the bronchoscopic tube, into two or more parts; and I commend the instrument or pin-cutter, devised for this purpose, as a desirable addition to our bronchoscopic apparatus. The chief import of my theme can be expressed in the statement that had the device and the principle now proposed for its use been already in vogue, a second operation for the extraction of this transfixed steel pin would not have been required. (Fig. 4.)

A valid criticism, which will at once suggest itself, is the disposition of the parts of a pin, when cut, to fly asunder, hence, possibly, to drop out of sight or out of reach of the bronchoscopic forceps. Thus, I feared that my smaller fragment might get lost in the bronchial secretion and, as after dividing the pin, less than a quarter-inch of the larger fragment would remain exposed, I feared that it might disappear, by retraction, wholly around the curve of the bronchial branch. But neither of these contingencies occurred; for the beak-shaped, slotted, scissor-like device I had modeled in the rough to cut into two pieces,

not punch into three, with the expectation, further, that one of the two pieces might adhere in its beak, thus limiting the scattering of fragments. My suggestions were skillfully elaborated by the makers, and happily the mechanism even exceeded my expectations in this regard. I observed while testing the instrument that not only as expected would one of the fragments adhere in the serrated slit alongside the bevel, but that it adhered with dependable regularity and firmness as long as the blades were not permitted to reopen; moreover, as it was invariably the end of the pin next to the beveled side of the blade which so ad-

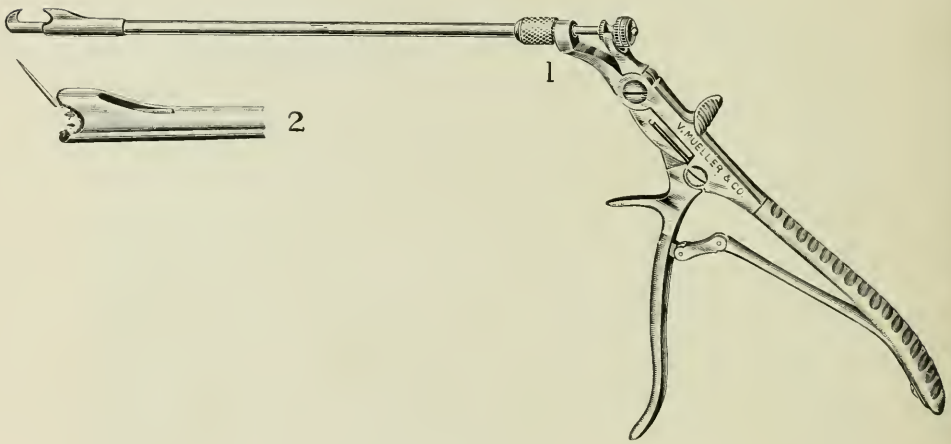


Fig. 4.

Casselberry's bronchoscopic pin-cutter and fragment-holder.

hered, the operator could elect the fragment to be held and the one to be let loose, provided the pin were transfixed in space enough to admit the jaws either under or over it, hence to turn the blade bevel next to whichever end he might elect.

Profiting by these test observations, I planned to minimize the risk of losing my smaller fragment by electing it to be held in the grasp of the pin-cutter, and to diminish the risk of letting loose my larger fragment by cutting it off not too close to the bronchial branch. Beyond these precautions, the chance that the fragments might still get lost was, I felt, a bare chance that must be taken.

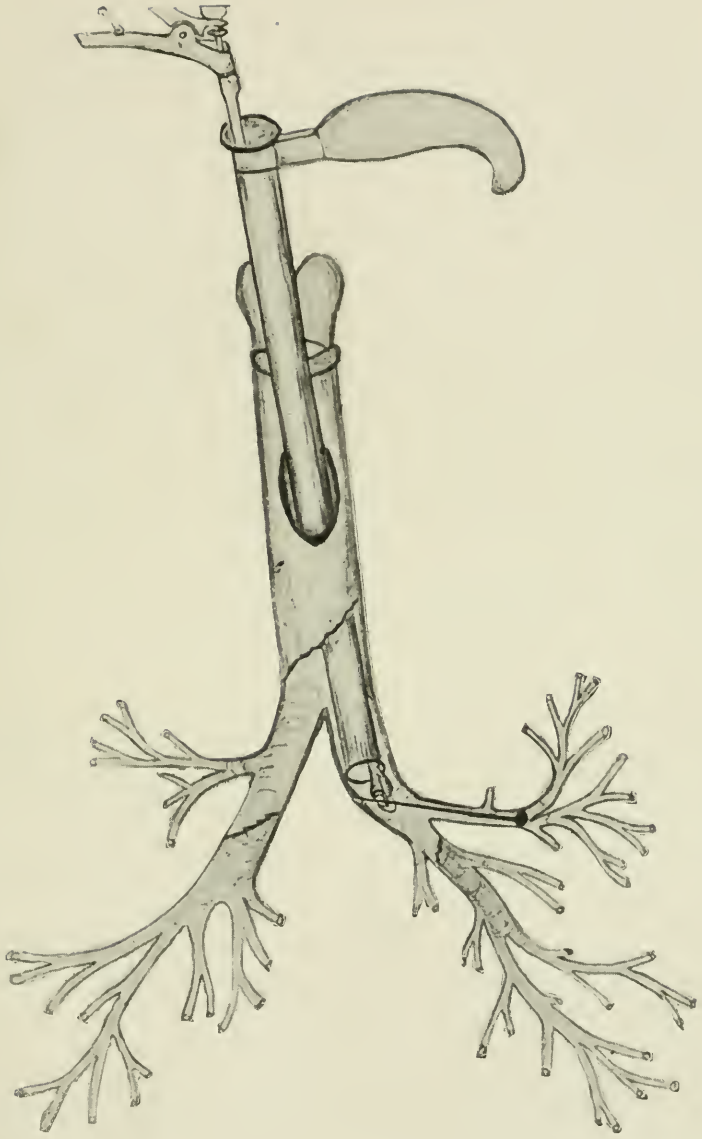


Fig. 5.
Showing the method of cutting the transfixed pin in two.

I questioned the absolute necessity for shortening the route to the pin by opening the windpipe, but considering the novelty of the procedure of cutting the pin *in situ*, a position none too near at best, I deemed it inexpedient to add uncertainty by adding distance. However, it is now realized that the pin-cutter and the principle of its use are applicable as well at the longer range of upper bronchoscopy. In fact, the only uncertainty encountered in the final operation was not in cutting the pin, but in finding it before cutting it, a delay which was incidental to the tracheal opening, for the bronchoscopic tube, when entered at the incision, was deflected by the chin somewhat out of its most favorable line; so despite the distally lighted Jackson tube, augmented by a Brunig-Killian headlight, and the best conditions for artificial lighting in the semi-darkened throat-room of St. Luke's Hospital, a combination which yielded a brilliant illumination of the bronchial tree, the pin, for a time, could not be seen. The same competent aids were present, but having made

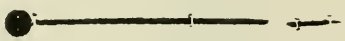


Fig. 6.

The pin in two parts; actual size.

the low tracheotomy as a first step in this operation, the patient's head had not been adjusted precisely in the Boyce position. A readjustment of the head caused the chin to drop out of the way, when on passing the tube again through the tracheal opening, but directing it as nearly in the median line as during the upper bronchoscopy at the first operation, the pin came plainly into view, being in the same location and in the same state of transfixion. A few additional efforts to extract it without cutting having proved futile, the pin-cutter came next in order. (Fig. 5). It operated exactly as planned; one could hear the snap, see the larger fragment shiver and then discern the small pointed piece in the beak of the instrument, held fast in which it was withdrawn. The larger piece settled somewhat, but its short exposed end was now an easy mark, and in another minute, in the grip of a Jackson forceps, it also came safely out. (Fig. 6).

Discussion.

Dr. Chevalier Jackson: Dr. Casselberry brought up the point of the unreliability of a negative X-ray. We have all been deceived by this at times, and frequently we must make endoscopic examination in the face of a negative report from the radiographer. We may get a history of a metallic body when it is not metallic, and not dense enough to show. Dr. Emil Beck made me some radiographs with the aid of bismuth emulsion that serve as a complete map of all the bronchial tubes. I have a series of six negatives reduced to sizes equivalent to different ages. In use these underlie the negative containing the foreign body as a transparency, giving one a map of the bronchial tree on the plate showing the foreign body, for the purpose of determining in which bronchus the foreign body is located. Dr. Casselberry's case demonstrates the extreme degree of ingenuity at times required to get out a foreign body without doing injury to the patient, and such cases as this and such as Dr. Richardson reported last week show how ingenuity can overcome seemingly insurmountable difficulties. Mechanical ingenuity and skill are required rather than intellect. In a case I saw with Dr. Coakley, I utterly failed. It was a pin similar in size and form to the one Dr. Casselberry so skilfully removed.

Dr. C. G. Coakley: I had a very similar case to that which Dr. Casselberry has reported to-day. The pin had been in the bronchus a month when a general surgeon asked me to see it. He had a skiagraph which located the pin within the first division of the bronchus. I expected to be able to extract it without any great difficulty by passing the tube through the larynx. The patient was a woman of about fifty years of age and moderately stout. After cocainizing the larynx and passing the tube through the larynx into the trachea. I found it impossible to continue down to the bifurcation, owing to the unusual position of the trachea, which was bent to the left by a large thyroid gland. No amount of force that I dared to use would allow it to pass. Dr. Curtis then did a tracheotomy, dissecting away the thyroid gland. By that time the patient was not in very good condition, and we did not pass the bronchoscope at that time, but waited two weeks, in the meantime having a second skiagraph taken, which showed the pin further down. This time I was able to locate the pin and grasp it with the forceps; the only method of removing it, however, seemed to be to push it down and then bring it up; the patient had a severe coughing spell, and I pulled

the tube out, but the spasm of coughing dislodged the pin and several attempts failed to get it again. It was two weeks before we could again attempt to remove the pin, and another X-ray showed it to be still lower in the tube, and all efforts failed to locate it. I communicated with Dr. Jackson, and he kindly consented to come over. According to my recollection, he was unable to see the pin but could feel it, and could not extract it. In the course of six months the patient developed an abscess of the lung, followed by pneumonia, and died. The case has not been reported. If we had had the instrument shown by Dr. Casselberry our efforts might have been successful.

Dr. T. H. Halsted: Three or four months ago I had a case which illustrated a point Dr. Casselberry made, viz., the danger of losing the fragment. A little girl of eight inhaled a large brass-headed upholsterer's tact, with a shank a third of an inch in length. She had acute laryngeal obstruction and spasm, which threatened suffocation, but things apparently cleared up. Later, however, she developed symptoms and was brought to me. An X-ray showed the tack in the second division of the right bronchus. Upper bronchoscopy was done and the tack located at that situation.

With the Jackson forceps I caught the shank and was withdrawing the tack when it encountered some resistance and slipped off. I went down again and found the tack in its former position, but several attempts failed to remove it. The difficulty was that it was so imbedded that though the forceps grasped it, the head did not budge. I then did a lower bronchoscopy, and with the Alligator forceps reached the foreign body and removed it, but only the head, the shank, to my surprise, not being present. Repeated examinations failed to discover it. There had been a considerable amount of mucus and some vomiting, and I concluded, after many attempts to locate it, that I had in my first attempt separated the shank from the head and then lost it, either in some other portion of the bronchial tree or had actually removed it and lost it in the mucus. It could not be found, however. Before the tracheotomy tube was removed on the fourth day several radiographs were made to discover if the shank had been lost, but the chest was perfectly clear.

The child made an uninterrupted recovery. The case is reported merely to show how easily a fragment may be lost.

Dr. Emil Mayer: We all owe Dr. Casselberry a great deal for having presented this ingenious instrument, which not only cuts but grasps, so that there is no danger of cutting off a piece of pin and not being able to find it. Speaking of attempts to remove a foreign body by the bronchoscopic method, there are

many things we do not know about. I recall the case of a child with a foreign body in the bronchus on the right side, low down, not presenting many symptoms, where the X-ray showed the tack plainly. I was asked to see the case. It was easy to introduce the tube, but it was impossible to see or feel anything. I refused to put in any instrument to remove a foreign body that we could not see, for I felt that we should see it before attempting to remove it. The foreign body had been in so long that granulations had formed, and it had become so wedged that it was not producing symptoms, and I felt that it would be harmful to the child's best interests to attempt to remove it. The attending physician agreed with me. The child is perfectly well, except we know that it has a tack in its bronchus.

Dr. R. C. Myles: The suffering and anxiety caused by the efforts to remove a foreign body from the respiratory tract are often intense. Before the days of bronchoscopy, a carpet woman applied to me for removal of a long tack from her larynx. The sharp end of the tack was imbedded in the anterior end of the left vocal cord, the head of the tack was lying on the margin of the right vocal cord, near the processus vocales. It was evident that any movement or disturbance might mark its fall into the trachea. I placed the woman on a low table, with her head on the floor, and tried to remove it while I was lying on my back, and the woman practically standing on her head, but failed. After many efforts, finally, I seized it, while she was in the unusual position, with a pair of heavy forceps, but the spasm of the larynx and the ventricles held the tack fast until a sudden movement of the patient caused it to tear its way out. The parts that were lacerated healed kindly.

Dr. Casselberry: It is with no thought of self-aggrandizement, but rather to honor Dr. Jackson, who is known to have made an unusually intelligent application of mechanical ingenuity, that I take exception to his statement that the latter, not intellect, is required in these cases. A motive running throughout my paper seeks not alone to describe the mechanism, however ingenious, but to convey in logical sequence the train of thought and intelligent management required to overcome successive adversities ere the culminating technical moment could arrive. The elimination of X-ray delusions; consideration of anatomical planes; preparation for acceptance of its diagnostic value to offset the discouragement of failure in extracting the pin at the first operation; knowledge of pathology teaching avoidance of success by force at the risk of tearing vital parts; discernment of the requirements in the new device and an insistent firmness under the pressure of delay to test and reject

unsuitable models; the judging of chances and the formulation of a systematic yet elastic plan of procedure; resourcefulness in expedients and quick decision to obviate the final difficulty in refinding the pin—all required intelligent effort during a period of two weeks, and it alone rendered possible the mere mechanical period which from the moment the pin was brought into view through the bronchoscopic tube until it was cut in two and safely extracted was but four and one-half minutes.

EPITHELIOMA OF THE LEFT VOCAL CORD.

BY CHARLES W. RICHARDSON, M. D.

In February, 1908, Dr. Karpeles brought to me for observation a young man of forty years of age. The patient had been employed in New York in quite arduous office work and had run down considerably during that Winter. In October, after a "cold," he developed a hoarseness which remained persistently and of about the same intensity. There was a slight cough. He had been under treatment during the whole period, that is, from the time the hoarseness developed until his coming to Washington, for chronic laryngitis. There was no pain nor glandular enlargement. Examination of the larynx showed the left cord to be congested throughout its whole extent with some proliferation near the anterior commissure. The left cord was quite normal in its appearance. There was no fixation and the motility of both cords was normal. Examination of chest as well as of sputa was negative as to tuberculosis. Although there were no positive evidences of tuberculosis, the unilateral congestion of the vocal cord, the general condition of the patient, and his age, led us to believe that the condition looked more like a tuberculous process than a malignant one. The patient was placed under the most approved methods for the treatment of this condition, general as well as local. Under treatment of about four weeks, the patient's general improvement was very marked, although the local laryngeal lesion remained about the same with slight increase in the cellular proliferation. The malignant nature of the process now seemed the most probable, and it was decided to remove a portion of the growth for microscopic examination. At the time of the removal, the centre of the unfiltrated area, about two millimeters in diameter, showed a grayish white appearance. The small mass removed was given to Dr. B. L. Randolph for microscopic examination. In due time he reported the growth as undoubtedly epitheliomatous in nature. Immediate preparations were made for operative intervention.

On Sunday, March 25, 1908, at 3 p. m., the operation was done. The operation consisted in the usual thyrotomy without tracheotomy. The patient was in a moderate Trendelenberg position. There was practically no hemorrhage in doing the operation. On opening the larynx, a solution of suprarenal extract and cocaine 20 per cent was applied to the mucous membrane. The larynx was held well open and an excellent view obtained of the growth and its extent. The method employed in the removal of the growth was by subperichondrial separation of the mass. A Killiam separator was inserted between the perichondrium and the thyroid cartilage along the divided margin on the left side and the cartilage of the perichondrium stripped from its upper to its lower border and all the way back to its posterior border. The mass was then readily removed by the means of scissors. As a doubt existed as to the normal condition of the anterior portion of the right cord, the anterior third of this was removed through the same procedure. The mass removed, on examination, demonstrated that the growth had been removed beyond the line of safety in all directions. The parts were brought together and dressed in the usual manner. Healing took place by primary union throughout the greater portion of the incision. The whole wound had healed in the space of two weeks. The patient was up and about on the morning of the fifth day and was dismissed from the hospital on the seventh day. For the last ten months the patient has been actively engaged in his usual vocation in New York. I have seen him three times during the past year, the last time on April 10, 1910. On my last examination I found no evidence of recurrence, now thirteen months since the operation.

The interesting features in this case are the age of the patient and the method employed in the extirpation of the neoplasm. It is not usual to find a malignant neoplasm in an individual of only forty years of age. Growths of this character occur most frequently during and after the fifth decade of life.

The sub-perichondrial method of removal of an intrinsic growth of the larynx is according to the method suggested by Dr. J. Solis-Cohen to me at the Niagara meeting of this Association. In studying over the course to be employed in the re-

moval of the neoplasm it occurred to me that the sub-perichondrial method offered the best method that could be resorted to to thoroughly get beyond the point of possible invasion. In employing the method I was pleased to find how applicable the procedure was and how easy it was in its practical application.

Discussion.

Dr. J. Solis-Cohen: It is a great pleasure to me to hear these papers. A number of years ago I removed a case of obstructive growth of the larynx by the sub-perichondrial method, which is original with myself, so far as I know. The patient is still alive. When I performed that operation I applied compound tincture of benzoin to the denuded cartilage. Several of my friends who have performed the operation since have found it unnecessary to make any applications whatever.

In operating many years ago I used acid nitrate of mercury for prophylactic caustic purposes. In this operation you peel off the perichondrium to a certain distance beyond the growth, then lift up all the superjacent tissues together and cut it away with serrated scissors, and the mass looks not unlike a miniature representation of one of those crockery toys you see with a poached egg on it. You do not touch the growth itself at all, and so there is not the slightest likelihood of having conveyed anything into the healthy structures with the knife or scissors with which the mass has been excised. I think it was five years ago that I operated upon the last case, and that is the one to which I referred at the commencement of these remarks.

Dr. C. G. Coakley: I wish I could report as good a result as I have heard in these cases. A little over a year ago I saw a patient with a history of hoarseness for two years. It had the appearance of a maligant involvement of the right vocal cord; a portion was removed, and this opinion was confirmed by microscopical examination. Dr. Erdman operated. The growth seemed to be unilateral. The perichondrium was soft, and I felt that there was no use in leaving such a perichondrium. The whole of the cartilage and the right half of the larynx were removed. The patient did well and returned to his home in the West, but had that which occurs when part of the box of the larynx is taken out—a contraction—and a tracheotomy tube had to be inserted six months later. Two weeks ago there were signs of trouble, and some sections were sent on for examination; sections had been examined and pronounced to be nothing but granulation tissue, but this time the

pathologist was of the opinion that it was carcinoma. Professor Riene made an examination, and confirmed the diagnosis. He had involvement of the glands of the neck and swelling of the arytenoids. My opinion was asked as to further operative procedure, but I said that when the arytenoids were involved the pharynx was involved, or would be. I did not believe that a total laryngectomy would be of any avail in appreciably prolonging his life. Four or five years ago I did a hemilaryngectomy, and a year since I saw this patient with an apparent good result. In another case two years after operation there appeared to be a recurrence, but on examination it was found to be a cyst in some of the mucous glands in the posterior portion of the ventricular band. The cyst was removed, and the patient has been all right since.

Dr. A. W. Watson: Twenty-three years ago Dr. Cohen devised what was practically this operation, and to demonstrate its feasibility operated on a dog, at which operation I was present and assisting. The operation was successfully done, but the dog died later from hemorrhage, and so we were unable to observe the results. About the same time Dr. Cohen described the operation in a paper read before this association, April, 1887. He also reported a case operated on by the same method at the meeting in Boston in 1892. Later he modified the operation slightly by raising the periostium as well as the other soft parts, as has been done in the case under discussion. (Note: The first reported case operated by this method was that of Dr. George R. Fowler, of Brooklyn, Am. Jour. Med. Sciences, 1889, p. 692-3.)

Dr. T. P. Berens: Last week, before the American Laryngological, Rhinological and Otological Society, I presented a patient with the following history: A man forty-nine years of age, with epithelioma of the left vocal cord. He had been hoarse for five years before coming to me, and two years before the date of his first visit had been advised by a prominent member of this association to have the tumor removed intra-laryngeally. His family physician, however, persuaded him not to have his throat treated. I removed intra-laryngeally a large mass of new growth that occupied the whole anterior two-thirds of the left vocal cord, supposing it to be a papilloma. Dr. Jonathan Wright, however, pronounced it to be an undoubted epithelioma. After consultation with Dr. Delaven, we agreed upon an external operation. Having in mind to follow the procedure outlined by Dr. Cohen—namely, of raising the mucous-membrane and periosteum—on May 10, 1909, I split the larynx and cricoid, but found the adhesions of the soft parts to the cartil-

age, and therefore removed the whole cartilaginous wing of the thyroid and half of the cricoid; then stitched the wound in layers and inserted a tracheotomy tube at its lower angle. The patient made an uninterrupted recovery, visiting me in my office fourteen days after the operation. An interesting surgical point was that the trachea and larynx were opened bloodlessly by adhering to the following technique: The rings of the trachea were cut through without incising the mucous-membrane lining of the trachea. Adrenalin 1-1000 solution was then applied to this mucous-membrane before it was incised, and after its incision Adrenalin was sprayed into the larynx.

The man speaks with a useful voice and is able to use the telephone without effort. The cicatrix is a perfectly smooth one and does not occlude more of the lumen of the larynx than would a perfectly normal vocal cord. There is apparently no return of the growth.

Dr. A. W. Watson: Dr. Berens has spoken of taking out the wing of the thyroid in a case in which the perichondrium was found to be involved in the growth. The thought occurred to me that, instead of cutting away the entire wing of the thyroid, it might be better to separate the external perichondrium from the cartilage and leave it as an outer wall to the larynx.

Dr. H. L. Swain: I did not understand whether Dr. Richardson spoke of the formation of a cicatricial process or by what means his patient could speak in a loud tone. I reported to this association a case which had been three years without recurrence, and now, two years later, the patient is all right and can speak as loud as I. Here we took off the whole involved area, including the vocal cord, and there has been added in the way of a cicatricial formation a new band which is almost similar to the old vocal cord. It has a free, clear edge, with some range of motion, so that there is a pretty fair pair of vocal cords. It would be most interesting to hear from the other men who, like Dr. Jackson, have done a number of such operations, and I would like to know if what I have described is the usual result.

Dr. Emil Mayer: It is very remarkable, occurring in so young a man. I had an illustration of what might happen to any of us in any case of laryngeal stenosis. Two years ago I had a patient, a man, with all the appearances of cancer of the larynx, but I refused to take off even a small piece of the growth unless he was prepared to have the whole removed if the growth proved to be malignant; he refused, and he then went the rounds of all the clinics, but later came back to me and was willing to do what I wanted, and went into the hospital prepared for oper-

ation if necessary. I found to my surprise that our pathologist, Dr. Mandlebaum, reported it a non-malignant growth, and thought at first that I had not gone deep enough, but a second section was again reported not malignant. The patient was then put on antisyphilitic treatment, and is living to-day with no operation. Another case came to me, a patient sixty years of age, with so much dyspnoea that something had to be done, and that very promptly. I could not advise an operation of a radical nature on account of his physical weakness, so a tracheotomy was performed; but as soon as his physical condition warrants it I shall perform the operation which Dr. Richardson has described.

Dr. D. B. Delavan: Dr. Berens allowed me to see the case to which he has referred, and I felt that if properly handled a good result would be obtained. I have seen the patient several times since the operation and the results are in every way admirable.

With regard to the question of diagnosis I have lately had a case operated upon in which, during the process of the operation, two-thirds of a large tumor-like mass, larger than the end of the thumb, was sent to the pathologist, the remaining mass of the tumor being taken out later at the same operation. After the first fragment had been examined by the pathologist he reported it to be a practically typical papillomatous growth. Afterward, when he had time to examine the remnant of the growth, the report was "typical epithelioma." The case illustrates a condition in which the part of the growth adjacent to the interior of the larynx showed no signs of malignancy—so that the examination of a fragment taken from it in the usual way would have been misleading, just as the examination of the first fragment was misleading to us. Another point of interest is one connected with the case of Dr. Mayer. When the fragment was taken out for microscopical examination in this case the patient was warned that he should be prepared to accept the complete operation in case the growth proved to be malignant. This appears to be a complete confirmation of Dr. Mackenzie's position in this matter, namely, that irritation of a suspicious growth is bad.

Dr. Chevalier Jackson: I have a beautiful series of color drawings taken a month to seven years after thyrotomy, which illustrates the point that Dr. Swain refers to. The band that supplies the place of the cord assumes the form and function of the cord to such an extent that when seen a few years after operation it is quite customary for students to ask which side was operated upon. Usually the cicatricial band is quite vascular as compared with the normal cord. If the arytenoid has

not been injured at or before operation, the band takes on the function of the lost cord, and has motion and tension and vibrates synchronously with its fellow.

Dr. Richardson: I have nothing to add to what has already been said. I am very much disappointed at not being able to have the patient here, so you could hear his voice. It is remarkably clear, being not unlike the voice of one with a mild laryngitis; that is, moderately hoarse. In this case there is developing a band of fibrous tissue running from the anterior commissure to the arytenoid, as described by Dr. Jackson. When I first saw him a month after the operation there was simply a flat surface. Again when I saw him in November there was commencing to show evidences of the fibrous band, and the last time I saw him there was quite decided evidence of the band formation just in line, so as to come in apposition to the opposite cord. I suppose in time it will develop more fully. As Dr. Mayer states, the patient should be prepared at the time of the removal of a piece of growth for microscopic examination, of the possible nature of the condition, and consent should be obtained for immediate operation in case the growth proves to be malignant.

REPORT OF A FATAL CASE OF ASPHYXIA

Due to Pressure on the Trachea and Bronchus by a Tuberculous Mediastinal Gland.

BY CORNELIUS G. COAKLEY, M.D.

Patient, M. S. A. W., female, age three, was referred to me on May 3, 1909, by Dr. W. S. Stone, of Flushing, Long Island.

On February 23, 1909, the patient had a slight cold, and a week later seemed to add to that cold. About March 1 the patient had a cough, which the nurse thought was due to whooping cough. There was no vomiting associated with the cough.

The patient was taken to Dr. Stone, who made a careful physical examination of the chest, but was unable to find any lesion, nor was he sure that the condition was whooping cough.

Dr. Stone saw the patient several times during the month of March, but at no time heard the whoop which the nurse described.

About April 1 the parents noticed that the child was short of breath on running. This gradually increased, and about April 27 the patient was examined by Dr. L. E. La Fetra, of New York, who failed to find any pathological condition of the lungs on physical examination. The dyspnea was mainly expiratory, and he suggested some growth in the sub-glottic region of the larynx.

The patient was examined by me on May 3, at which time I was unable to see into the larynx, although the child was most tractable. The epiglottis could only be elevated sufficiently to see the arytenoids.

On May 4 I tried to get a view of the larynx with the Hays pharyngoscope, but was unsuccessful, and then, on cocainizing the larynx, attempted to pass a small bronchoscopic tube. The struggles of the child and the increased dyspnea induced were

such that I had to desist in the passage of the tube before being able to get a view of the interior of the larynx.

It was suggested that we wait a couple of days, and that the child be brought to a hospital in the city to have a general anesthetic administered, and direct inspection of the larynx and trachea by means of a bronchoscope.

The severity of the dyspnea on the night of the 4th and on the early morning of the 5th of May was such that I was requested to go to the patient's home to make the examination at as early a time as possible, as they feared that any postponement of the examination and relief of the dyspnea might result in a fatal asphyxia.

About noon of May 5, in company with Dr. W. A. Chisholm, I went to Flushing. Dr. Stone was to administer chloroform for the bronchoscopic examination.

The child was perfectly composed. With the first whiff of chloroform the patient became deeply cyanosed, respiration stopped, and it was a number of seconds before we were able to induce irregular voluntary breathing, as the result of artificial respiration.

The cyanosis gradually lessened, until at 3:30 P. M. the child's color and condition were about as they were before we began operating.

After consulting with Dr. Stone and the members of the family it was thought unwise to allow the child to pass another night without being in a general hospital, where immediate tracheotomy could be performed if necessary.

The child was taken to the New York Hospital in an automobile. By the time the child reached the hospital the breathing was nearly normal. Dyspnea was scarcely noticed.

In view of the past history and the necessity for operating under cocain anesthesia, it was deemed wisest to perform an immediate tracheotomy rather than to wait for the probable urgent tracheotomy in the course of a few hours.

Dr. Ellsworth Elliot, Jr., performed the operation under cocain anesthesia, a difficult procedure, with the child struggling and dyspneic.

I left the hospital about 8 P. M., as soon as the tracheotomy tube was inserted.

At 9:15 P. M. I was informed that the child was in an exceedingly dangerous condition, and probably would not live very many minutes. I hastened to the hospital. The general appearance of the child was that which one would see if the tracheotomy tube had slipped out of the wound. I at first thought that that accident had occurred.

We could, however, pass a small, flexible catheter through the tube, well down into the trachea, showing that there was no question as to the tube being in proper place.

The child gave a few gasps and died at 9:45 P. M.

The autopsy record is as follows:

COPY OF REPORT OF N. Y. HOSPITAL AUTOPSY REPORT—M. S. A. W.

Cause of Death—Status Lymphaticus. Occlusion of Trachea by Tuberculous Nodule. Laryngotomy.

Name—M. S. A. W.

Age—Three years.

Admitted—5th May, 1909.

Died—5th May, 1909, 9:45 P. M.

Autopsy—6th May, 1909, 11:15 A. M. Dr. Elser and Dr. Symmers.

Inspection—Body of a child, about 80 cms. in length, of well-developed frame, excellent nutrition and musculature. Skin of the entire body is smooth, pliable, very pale. Subcutaneous fat is abundant, bright yellow in color. Muscle tissue bluish-red in color, compact, firm, abundant. There is a surgical wound, about 3 cms. in length, in the anterior portion of the neck in the middle line. This wound is gaping and a probe can be inserted through it directly into the larynx.

Peritoneum—Unchanged.

Diaphragm—Fifth interspace on the right side, sixth interspace on the left side.

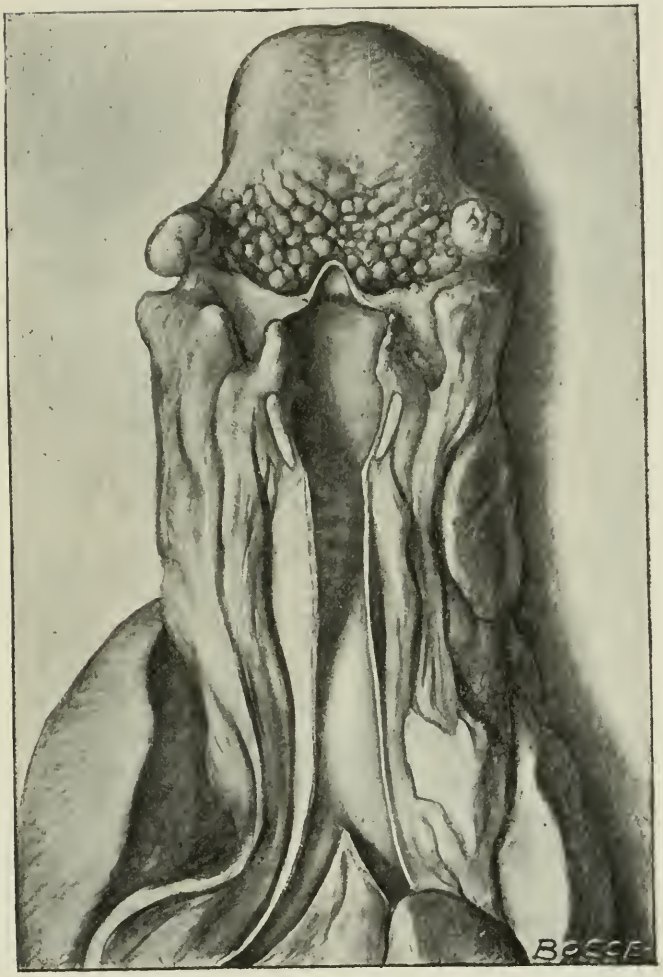


Fig. 1.

Longitudinal section of larynx and trachea, showing mass in lume of trachea and bronchus.

Chest—Thymus is present and is rather large in size (Weight, 16 1-3 gms.) It is pinkish in color, flattened, coarsely lobulated, and covers the entire upper two-thirds of the anterior pericardium.

Pericardium—Unchanged.

Heart—Normal in size. Left side contracted, right side moderately distended. Endocardium and intima of larger arteries well preserved throughout. Muscle tissue at the attachment of the posterior mitral leaflet about two-thirds of a centimetre in thickness. Muscle substance is reddish-yellow in color, firm, compact, and, on section, shows no naked-eye lesions.

Tongue, tonsils, larynx, trachea and lungs are removed altogether. The base of the tongue presents numerous large and small, hyperplastic lymphoid follicles. The tonsils are oval in outline, about 2 cms. in length, 1½ cms. in thickness, pinkish in color, elastic. The sub-mucosa of the oesophagus presents numerous scattered, pale elevations, about 2 mms. in diameter, corresponding to hyperplastic lymphoid follicles. The tracheotomy wound already described enters the larynx slightly to the left of the median line, completely destroying the left vocal cord. The right vocal cord is well preserved. The wound goes directly through and separates the thyroid cartilage in the middle line, and is about 2 cms. in length. The upper part of the trachea is well preserved. Beneath the mucosa of the trachea on the left side, near the bifurcation, there is an ovoidal mass, 2½ cms. in length, which encroaches upon the lumen of the trachea to such an extent as almost to occlude it entirely. The mucous membrane covering the mass is pale, smooth, atrophic.

Lungs—The lungs are irregularly and coarsely mottled. The pleura throughout is thin, smooth and glistening. At the apex of the left lung is a large, firm nodule, which, on section, presents a finely granular, pinkish, mottled surface. On section this mass reveals a quantity of thick, greenish-yellow pus lying near the centre. The lungs are not further dissected. The peri-bronchial lymph nodes are markedly hyperplastic.

Spleen—Considerably increased in size, bluish-red in color, capsule thin, smooth, tense. On section the organ cuts readily and presents a bluish-red surface. Scattered over it are innumerable hyperplastic lymphoid follicles. Pulp tissue is bluish-red in color and very abundant. Interstitial tissue is not visible to the naked eye.

Fig. 2.

Transverse section of trachea and lungs, showing bronchial gland and lung involved in tubercle.

Fig. 3.

Transverse section a little lower than Fig. 2, showing maximum size of tuberculous gland.

Kidneys—Left kidney: Normal in size, greyish-red in color, surface smooth, capsule thin, strips readily, leaving behind a faintly bluish, perfectly smooth surface. Cortex and medulla are well preserved. Cut surface, as a whole, is pale, and the cortical markings are indistinct and irregular in distribution. Right kidney: Like the left.

Liver—Normal in size, bluish-red in color, capsule thin, glistening, surface smooth. On section, the organ presents a bluish, smooth surface. The lobules are pale, fairly well differentiated, surrounded by faintly bluish streaks.

Gall Bladder—Presents no naked-eye changes.

Stomach—Presents no naked-eye changes.

Small Intestine—Throughout the intestines are numerous, pinhead sized, or slightly larger, pale elevations corresponding to hyperplastic solitary follicles. In the illium, Peyer's patches are markedly hyperplastic.

The solitary follicles of the large intestine are hyperplastic.

Mesenteric and Reno-Peritoneal Lymph Nodes—Are markedly enlarged, pale, elastic. On section they present a pale, smooth glistening surface. Contents of the pelvis well preserved.

Microscopical examination of a portion of the nodule described in the apex of the left lung reveals the presence of lymphoid tissue, in which there are numerous epitheloid tubercles.

Professor Robert M. Pearce examined the tissue histologically. His report is:

To left of and posterior to trachea, 5 cms. below the epiglottis, is a large caseous mass, distinctly encapsulated on its inner aspect, and evidently a tuberculous lymph node. This mass extends down to the bifurcation of the trachea. On its inner aspect it is closely applied to the cartilage of the trachea and causes a distinct encroachment on the lumen of this organ. At a point opposite the apex of the lung it measures 2.1x3.1 cms. and half a cm. below this point it is directly continuous with similar tissue in the apex of the lung, forming an irregular mass 1.5 cm. in diameter, extending mainly antero-posteriorally without involvement of the pleura laterally. The main peribroncheal mass diminishes in size until at hilous of lung it is only 0.4 cm. in diameter. The mucous membrane of trachea over mass is pale, smooth and atrophic.

Mass on section is greyish-white in color, with more or less pink mottling, granular and fine except for a central cavity containing a considerable amount of greenish-yellow pus.

Histological Examination of peritoneal mass shows remnants of lymph gland, with closely massed epitheliod tubercles containing giant cells, but with no caseation; centre of nodule shows caseation and softening, with leucocytic infiltration."

It is extremely doubtful whether it was possible to make a correct diagnosis in this patient during life, and then, if the diagnosis had been made, whether any operative procedure could have been instituted to prevent a fatal outcome.

Discussion.

Dr. D. B. Delavan: I was called to St. Luke's Hospital by Dr. C. L. Gibson to see an Italian child two and a half years old, and found a condition exactly answering Dr. Coakley's description. The patient was a beautiful and apparently well nourished child. He had been seized with dyspnoea, so urgent that a rapid tracheotomy was required. This had not succeeded in relieving the breathing. Under anaesthesia a very careful examination was made and an obstruction found in the middle part of the trachea. There had been severe spasm of the larynx in addition to the obstruction due to direct pressure on the trachea. The tracheotomy had relieved the laryngeal obstruction, but had not relieved the obstruction of the trachea. This was overcome by the insertion of a soft rubber tube long enough to extend below the point of obstruction in the trachea. The child lived for eight days following the last operation, the temperature remaining at a high figure. Autopsy showed a tuberculous lymph node pressing on the trachea. The child had general tuberculosis.

Dr. Chevalier Jackson: This is an exceedingly interesting case. It seems to me that we are gradually eliminating one after another the things which used to be classified as status lymphaticus. Had this case occurred in the routine of a general hospital, it would have been so labelled, but these conditions are now being analyzed, and such work as Dr. Coakley has done will add greatly to our knowledge. The attacks of dyspnoea alternating with periods of free breathing are so very deceptive that we often have great difficulty in convincing the general practitioner that, when a child has such an attack, tracheotomy ought to be done immediately and we should not wait until breathing has ceased in the middle of the night. The case reminds me very much of the in-

fant child of a physician that I saw with Dr. Baldwin, of Columbus. There were no symptoms of sepsis or of any tubercular lesion. The temperature had been absolutely normal. Dyspnoea was severe. I passed a bronchoscope through the mouth and found the bronchi obstructed with cheesy material. Tracheotomy was then done, but the child lasted only a few hours. Autopsy showed that both lungs were solidly tubercular, and lymph nodes had broken down and filled the bronchi with cheesy material. There was no lung left to breathe with. These cases used to be labelled status lymphaticus, but with such men as Coakley, Mayer, Halstead, Richardson, Mosher, Coolidge and Ingals looking down into the bronchi, the many conditions grouped under "status lymphaticus" will be differentiated. Nothing was said of the thymus gland, it is probably in the part of the pathologist's report that Dr. Coakley did not read.

Dr. E. F. Ingals: This brings to my mind a case seen last year, which is not exactly apropos, because not tuberculous, but one that had many of the symptoms like Dr. Coakley's case. The child was brought to the city with an almost typical history of a foreign body in the air passages. It had been taken with a sudden paroxysm of cough, which was followed by similar paroxysms at irregular intervals, in some of which the child almost suffocated. The child was sent to me by a surgeon who thought that there was some foreign body in the bronchus. Nothing was shown by the X-ray. The child was placed on the table and ether started, with a view to bronchoscopy, but the breathing became bad and I quickly did a tracheotomy and used artificial respiration. For about fifteen minutes there were occasional voluntary efforts at breathing, but although the artificial respiration was continued for an hour, together with various other methods, the child could not be resuscitated. A post-mortem was secured after the body had been removed to the former home in another State, about thirty-six hours after death. I had a report from the physician stating that a large thymus was found, part of which was adherent very low down. The thymus had caused the trouble, although the case gave as clear a history of foreign body as one often hears.

Dr. J. Solis-Cohen: A few weeks ago a child three years of age in a similar condition was brought to my office, having been examined by another laryngologist, and the case was reported as a tumor of the pharynx. I examined the child, but did not see any tumor. The patient was not suffering from dyspnoea when I saw it, and so I prescribed a placebo and made arrangements to have a further examination the next day, but on the next day I heard that it had been seized with another attack and had died.

I would like Dr. Coakley to give the character of the dyspnoea,

whether suprasternal or infrasternal. I thought it was an extraneous pressure in the case referred to, and so expressed myself. With regard to the thymus gland pressure, I have seen cases where as soon as the incision was made through the skin the relief from the release of the thymus gland was so great that the dyspnoea ceased at once.

Dr. B. R. Shurly: The case is interesting from another point of view. Before the days of bronchoscopy and during a very active period of intubation, it happened occasionally that there were cases of apparent laryngeal dyspnoea, where the tube was passed with absolutely no relief. At present we are all familiar with that sort of thing, yet the text-books scarcely mention the presence of mediastinal disease in children. We are familiar with mediastinal conditions met with apparent frequency in adults, but the possibility of mediastinal pressure in children is not appreciated by most of us. The presence of the lymph nodes can sometimes be determined, but it is exceedingly difficult. The signs are obscure, and yet some diagnosticians can classify these cases in children quite frequently. I have never been able to do so definitely without the aid of the X-ray.

Dr. J. Price-Brown: Can this view of the question be applied to adults as well as children? Some years ago I was called to see a man who had suffered from difficult respiration for some time, and finally, when almost in a dying state, his physician sent for me to do intubation or tracheotomy. I did intubation with no result; then I did tracheotomy, and the relief lasted for some hours. There was no pressure within the larynx, nor diagnosis of any disease, yet the result was fatal. He was cyanosed when I got there. Post-mortem was not allowed.

Dr. Coakley: I was very much interested in Dr. Jackson's remarks on the subject of status lymphaticus. I have always questioned why these cases of sudden death should occur, and in many no autopsy has been performed. The pathologist's report is a very excellent one and is very interesting. The first cause of death given is status lymphaticus; the second, occlusion by tuberculous nodule. "The thymus is present in rather large size" (quoting). It is very interesting from the pathological standpoint.

The most interesting point is the dyspnoea. Dr. Cohen asked about that. When the child was carried into my office first its color was perfectly normal, and I could not believe that it had any such condition as the parents described. There was very little dyspnoea, but the child walked up and down across the floor and it was sufficient to induce considerable dyspnoea and moderate cyanosis; it was apparently inspiratory and expiratory,

but with the expiratory somewhat more marked than the inspiratory. Dr. La Fetra sees a great many children and was much interested in this case, but said that it was an absolutely novel condition to him, and he sees a good many autopsies in the Children's Hospital, where many tuberculous cases are seen.

Dr. Halstead: Was there any cough?

Dr. Coakley: There was absolutely no cough. The history of the case in the beginning suggested whooping cough. They were prominent people in New York, and took great pride in their children, and it did not seem like whooping cough. At no time did Dr. Stone make it out to be whooping cough. There was no temperature, nothing to go by.

EXHIBITION OF ANATOMICAL PREPARATIONS DEMONSTRATING COMMUNICATIONS BETWEEN THE BLOOD VESSELS SUPPLYING THE DURA, THE ORBIT AND THE NASAL CHAMBERS.

BY GEORGE E. SHAMBAUGH, M.D.

The nasal accessory sinuses, with the single exception of the maxillary antrum, come into close relation with the cranial cavities. The relation between these sinuses and the orbit is even more intimate: the floor of the orbit is separated by a thin plate of bone from the maxillary sinus; the median wall of the orbit is formed by the orbital or paper plate of the ethmoid which separates the orbit from the ethmoid cells; the frontal sinus by its supra-orbital extension reaches often over the entire roof of the orbit, separated only by a thin bony plate; the sphenoid sinus, and especially the posterior ethmoid cells, frequently come into close relation to the optic nerve.

Various complications, both intra-cranial and orbital, are associated with disease of the nasal cavities and their accessory sinuses. The more severe complications, such as the orbital and intra-cranial abscesses, are dependent usually on direct extension through dehiscence of the separating bony plate or through softening of this plate. The complications, particularly those of a milder character, such as oedema and swelling of the orbital structure associated with inflammation of the nasal accessory sinuses, frequently occur when there appears to be no change in the separating bony wall. These complications are evidently dependent on blood-vessel and lymphatic communications between the nasal cavities with their accessory sinuses, and the structures of the orbit and the intra-cranium.

The blood-vessel communication between the nasal cavities and the dura, especially the anterior and the posterior ethmoid vessels, can be readily made out in gross dissection. Communi-

cations between the blood supply of the mucous membrane of the nasal sinuses and that of the dura and the orbit cannot be so readily demonstrated, since the use of a microscope is here required. When it is shown, however, that the blood vessels of the dura and the orbital periostium, as well as those of the nasal mucous membrane and of the membranes lining the nasal sinuses, send branches to supply the bony plates separating these structures, we can readily assume that communications between these two sets of vessels take place within the bony partition plate. Blood vessels supplying the underlying bone, both from the dura and the periostium of the orbit, as well as from the mucous membrane of the nasal sinuses, can be readily demonstrated.

Zuckerkandl, by injecting the superior longitudinal sinus, was able to inject not only the blood vessels of the bony wall separating the frontal sinus but injected as well the blood vessels in part of the mucosa of the frontal sinus and some of the mucous membrane of the nose. Killian, by removing pieces of the bony plates separating the ethmoid cells from the orbit as well as the plate separating the frontal sinuses from the cranial cavity, was able to show communicating blood vessels between adjacent cavities.

I have undertaken to demonstrate these blood-vessel communications by first injecting the blood vessels and then making thick sections which can be studied under the stereoscopic microscope. The material used in this demonstration was the human embryo of various ages up to the full term foetus. The blood vessels were injected with Prussian blue while the material was still quite fresh. The heads were later decalcified and preparations were made including the nasal cavities and the orbits. These were embedded in celloidin, and thick sections were made and studied under the stereoscopic microscope. These preparations show beautifully the blood supply of the dura, the orbit and the nasal cavities, all sending branches freely into the surrounding structure in which the accessory sinuses later develop. The veins from the mucosa of the nasal chamber are also shown penetrating the cribriform plate to communicate with the veins of the dura.

Discussion.

Dr. H. P. Mosher: I am sure that all the members thank Dr. Shambaugh for presenting his specimens and for bringing the subject which they illustrate up to date. The statement is found in many of the anatomical books that the blood vessels of the sinuses enter the cranial cavity, but seldom is there any actual proof given. The specimens which we have just seen, however, demonstrate clearly that the statement is true. Therefore they are most welcome and most valuable.

Dr. E. F. Ingals: I would add that with this paper, as with Dr. Wilson's, we do not discuss them because we do not feel qualified.

SOME POINTS IN THE COMPARATIVE ANATOMY OF THE LARYNX IN THE ANTHROPOIDEA.

BY J. GORDON WILSON, M.B.

As laryngologists we are specially interested in an organ which comparative anatomy shows has evolved from a protective mechanism placed at the entrance to the respiratory tract whose two muscles functionate as dilator and constrictor. Through slowly progressive developmental stages the simple anatomical structure requisite for this primitive physiological function has been modified with correspondingly additional activities, till now we see a peripheral mechanism in which the primitive action is completely overshadowed by a physiological function which may be called inter-relational, a function which has passed beyond the limits of the larynx and has reached its highest significance in the close intercourse which it renders possible between mankind. While voice is not confined to man, yet here it has reached its culminating grandeur and importance, a consummation which would appear to mark it off from all other peripheral organs. While not regarding the larynx with its functional expansion as playing a role so important in the phylogenetic history of the race as the central nervous system, yet when one notes the marked developmental progress which a study of comparative anatomy demonstrates, and when one recognizes the important part which the voice plays in the social progress of mankind, the philosophical laryngologist may well ask how much influence has this laryngeal development had on man's superiority. The more he philosophises, the more certain he becomes that this organ, adapted for inter-relational life, is better fitted for comparative study than many which have attracted greater attention. With such a comparative history to point to, and with the obvious probability that progression may

still be present, one may well ask, has this development reached its culmination, and if not, along what lines is it tending. In the long and intricate path which comparative anatomy maps out in laryngeal progress, some stages are sharply defined, but the majority blend intricately with each other. In such a comparative study there are presented some of the most interesting problems in vertebrate evolution. For instance, there are here seen such important macroscopic and microscopic differences between man and the higher mammals, especially the anthropoid apes, as to indicate along which lines development has taken place and probably is still in progress. While not emphasizing the importance of the larynx on the characteristic vocalization of the different races of mankind, yet we may note that the anthropologist seeks to find here typical distinctions between various races. Finally, we would assert that through such a study much light may be thrown on many obscure physiological problems in voice production.

My object in this communication is to draw attention to one or two characteristic features which have recently been forced upon me. It has, within the last year, been my good fortune to be able to study macroscopically and microscopically the larynges of a Chinaman, of an orang-utan, of several macacus monkeys and of a marmoset. I was able to compare these, on the one hand, with the larynges of an adult and infant of the Caucasian race, and on the other, with the larynx of a young lion, as well as with the larynges of some of our common domestic animals, such as the dog, cat and horse.

It would be impossible as well as undesirable to give and discuss here a detailed account of such a study. My desire at this time is to present a preliminary report on some of the more interesting and important findings, and I shall confine my remarks to a comparative study in the anthropoid apes and in man of the ventricles and appendices of the larynx and of the musculature lying directly in relation to the vocal cord, namely, the thyroarytenoid. Finally, I shall discuss some physiological considerations suggested by these anatomical findings.

In this paper the following classification of the Anthropoidea given by Beddard[1] will be used:

Sub-order.	*Family.*
Anthropoidea.	Hapalidae———Marmoset.
	Cebidae.
	Cercopithecidae-Macacus.
	Simiidae———Simia satyrus (orang-utan).
	Hominidae.

It will be noted that in the above examination examples are included from the principal families except the Cebidae.

I.—The Ventriculus Laryngis and Its Appendix.

For the purpose of this paper we shall define the ventricle of the larynx and its appendix as follows: The ventriculus laryngis is a pocket-like diverticulum which passes lateralwards between the true and false vocal cords, undermining to a varying degree the false vocal cords; the appendix ventriculi laryngis is a blind sac which projects upwards from the ventriculus.

Hominidae.

In the white race the ventricle communicates by an oval opening with the cavity of the larynx. Its dimensions are very variable, relatively it is much larger in the male than in the female. We may take the figures of Poirier and Charpy[2] as a good average, namely the length 20 mm. in the male and 13 mm. in the female. The height varies from 4-8 mm. The anterior extremity terminates at each side of the middle line at the angle of the thyroid, immediately beneath the insertion of the epiglottis, by the true and false vocal cords uniting or ending slightly apart from each other, and by the floor of the ventricle passing imperceptibly into the laryngeal cavity. In the larynges I examined for comparison the floor of the sinus was horizontal, with little or no sign of a depression or downward slope behind the true vocal cord. The lateral wall is furthest from the vocal cord in the middle or slightly nearer the arytenoid end. Anteriorly this lateral depth gradually decreases and passes medialward into the wall of the larynx. Posteriorly it ends at the border of the arytenoid without dipping either behind it or the processus vocalis.

The appendix in the white races arises by an open mouth 6-8 mm. long, lying chiefly anterior to the middle point of the larynx. It is usually described as passing into the aryteno-epiglottic fold, but it would be better to say that it passes between the aryteno-epiglottic fold and the thyroid cartilage. Its height is very variable, not only in individuals of the same race, but even in the same individual. Usually it runs up about 1 cm. and terminates just below the level of the upper border of the thyroid cartilage. I have occasionally seen it reach to the level of the hyoid, and on one or two occasions to the base of the tongue. Occasionally it may be wanting on one or both sides. Its loose walls lying in folds contain glands and lymphoid tissue. A considerable amount of muscle tissue lies all around the ventricle.

The most interesting anomalies found in connection with the ventricle and its appendix in the white man are.

1. A depression in the middle line anteriorly connected with each ventricle and constituting the central fossa of Merckel. This fossa in the case described by Broesicke[3] had penetrated the cartilaginous plate and formed a median ventriculus laryngis.

2. Abnormal size of the appendix. Such examples would include not only the abnormally large intra-laryngeal appendices, but in addition those rarer lateral extra-laryngeal sacs which pierce the hyo-thyroid membrane, examples of which have been described by Gruber[4] and by Sclavunos[5].

*Chinaman.**

The Chinaman appeared to have been about thirty-five years of age. He was tall and well developed. From external appearances it was supposed that he was a native of northern China. The cadaver had been injected with preserving fluid and had been for some months in a cold chamber previous to dissection. This had produced considerable shrinkage in the soft tissues; otherwise the larynx was in a good state of preservation.

The larynx, compared with a male of the white race of approximately the same age, was conspicuously smaller. The di-

*I can find no description of the larynx of a Chinaman in the literature; this appears to be the first one described. A full description will be published later.

mension measured transversely across from the middle of the crico-thyroid membrane was 18 mm. as compared with 21 mm. in the white. The rima glottidis was 21 mm. as compared with 25 mm. in the white male and 25-30 mm. given by Nicolas.[6] There is a well-marked philtrum ventriculi (Merckel). The ventricle communicated with the larynx by a wide oval space, whose length was 15 mm. and breadth 6 mm. This was compared with a small larynx of a white man of about the same age, which was found to be 21 mm. by 8 mm. The average given by Nicolas is 20 mm. As a result there is here a large respiratory space. The true vocal cords were separated from the false cords anteriorly by a well-marked horizontal depression, which extended across the middle line as a distinct narrow sulcus or canal of 1 mm. in depth. The floor of the sinus is horizontal, except that posteriorly it inclines downwards and lateralwards and is deepest posteriorly; here the venticle passed behind the arytenoid cartilage, forming a considerable pocket 2 mm. deep posterior, lateral and inferior to the processus vocalis.

The appendix opens by an oval mouth 3.5 mm. long on the right side, slightly larger on the left. This opening lies exactly in the middle line. A probe could be passed into the appendix for a distance of 10 mm. on both sides.

The characteristic features of the ventricle were:

(1) pouch behind the arytenoid,

(2) anterior sinus,

both of which are Simian characters.

Orang-Utang.

The orang was a well-developed female of 18-20 months, which died of broncho-pneumonia.

The ventricle is connected with the larynx by a mere chink between the true and false vocal cords. From this opening the ventricular cavity extends downwards behind the true vocal cords for a distance of 8.5 mm., then curves upwards on to the lateral wall, which is 4.5 mm. distant from the tip of the true vocal cord. The medial wall anteriorly undermines the false vocal cord to a height of 0.5 mm. Anteriorly the true and false vocal cords do not unite, but their edges come into close appo-

sition. The ventricles of the larynx are here connected by a well-defined canal, 1.5 mm. in depth and almost circular. This canal is formed by the union of the true and of the false vocal cord of one side with corresponding cords of the opposite side. Owing to the close apposition of the edges of the true and false vocal cords, the canal comes most clearly into view when the larynx has been opened in the middle line posteriorly or when the thyroid has been divided in the middle line anteriorly. Posteriorly the true and false vocal cords meet and form an uninterrupted membrane extending over the posterior part of the ventricle. Below the membrane the ventricle extends for a distance of 6.5 mm. behind and below the arytenoid.

The laryngeal appendix communicates with the ventricle by an oval mouth in the middle of the roof of the ventricle measuring 3.5 mm. in length. It consists of an intra-laryngeal part and an extra-laryngeal part often called the laryngeal sac. The intra-laryngeal part is a short canal with collapsible walls. The extra-laryngeal sac communicates with the intra-laryngeal sac by a slightly dilatable opening 6 mm. by 2.5 mm. The long axis of this oval corresponds with and lies adjacent to the inner surface of the thyroid cartilage, the anterior end of this oval lies within 6 mm. of the middle line of the thyroid, and the whole opening of the extra-laryngeal sac lies more anterior than posterior. A probe can be easily passed from the ventricle upwards and outwards into the extra-laryngeal sac. It is then seen that the canal pierces the thyro-hyoid membrane lateral to m. thyreohyoideus, and opens into a soft loose-walled cavity, whose walls are thrown into numerous folds. The extra-laryngeal sac was only covered by skin and platysma muscle. On account of the accidental removal of part of the sac on each side during the post-mortem examination it was impossible to estimate its full dimensions; but it appeared to correspond in form and size to the sac figured by E. Mayer.[7]

The most distinctive features of the ventricles and its appendages are:

(1) Their union across the middle line anteriorly.

(2) The pouch-like cavity posteriorly behind the arytenoid.

(3) The extra-laryngeal sacs.

Macacus Rhesus.

In a large Rhesus monkey, the antero-posterior diameter of whose larynx from the middle of the cricoid was 13 mm., the entrance to the ventricle is a mere slit. The length of the true vocal cord is 7 mm. Near the tip of the processus vocalis the true and false cords come together and form a membranous band 1.5 mm. in extent to the border of the arytenoid. This aids in forming the posterior recess of the ventricle which passes behind the arytenoid for a distance of 2.5 mm. The floor of the ventricle is almost level with the edge of the true vocal cord, and the false vocal cord is only slightly, if at all, excavated except where the appendix comes off. Anteriorly the true and false vocal cords approximate near the middle line. No canal or sulcus exists as in the orang; on the other hand, the cords of each side are separated by a vertical median furrow which passes up into the entrance of the median sac, so that a probe passed from below up the furrow passes into the sac.

The appendix passes 6 mm. beyond the tip of the false vocal cords.

The median or third sac comes immediately into view when the thyro-hyoid muscles are lifted. It is a large flaccid walled sac, which fits into the excavated body of the hyoid above and lies below in the notch of the thyroid cartilage, to the upper border of which it is firmly fixed. It can be easily detached from the hyoid. It communicates with the larynx by a short canal opening, as above described, at the angle formed by the insertion of the epiglottis on the thyroid cartilage—an angle in this case of 120 degrees.

Marmoset.

The aperture between the true and false vocal cords is a mere slit. The ventricle extends anteriorly to within 0.5 mm. of middle line. No transverse sulcus connects them; on the other hand, as in the Rhesus, they are separated by a median longitudinal gutter. At the upper part of the median gutter lies a marked depression suggesting the opening of a median sac—but no trace of any sac can be seen on careful dissection. Above this depression the epiglottis springs forward at an angle of about 160 de-

grees. A probe passed up from the ventricle into the appendix reaches into a small cavity in the hyoid near the middle line. The body of the hyoid is expanded, being 1 cm. broad in the middle line, and indicates the position where both appendices meet together though they do not fuse.

In microscopic sections the walls of the ventricle are seen to have many folds. The appendix is found to a great extent surrounded by cartilage; one might say that it lies in a cartilaginous cavity. Attached to the wall of this cartilaginous cavity are numerous bands of dense fibrous tissue, which disperse themselves in the elastic and connective tissue around the appendix; but no muscular tissue is seen.

II.—The Relation of the M. Thyro-arytaenoideus to the Vocal Cord.

There is one muscle which, from its anatomical position, seems admirably located for the production of various modifications of sound, and to which one looks for some explanation of the diverse qualities of sound, namely, the m. thyro-arytaenoideus. A comparative study shows that this muscle presents marked differences in its relation to the vibratory mechanism in the different families of the Anthropoidea. Also great individual variations are observable not only among the races of man, but even in our own species. In each case the muscle was examined both in gross dissection and in coronal serial sections.

Marmoset.

In this animal the true vocal cord projects as a triangular prismatic mass above the level of the ventricular floor, with base below and apex above. Its dense connective tissue contains elastic fibres and glands, but no muscle. The thyro-arytenoid muscle lies some distance below the cord, and is seen as one complete mass, which passes uninterruptedly from its thyroid origin to its arytenoid insertion. It lies close to the fibrous tissue, but at a considerable distance from the ligamentum vocale; no fibers are seen breaking off to enter the fibrous tissue. No fibers pass from it around the ventricle or appendix. (Fig. 1.)

Fig. 1.
Marmoset (family Hapalidae).

EXPLANATION OF FIGS. 1, 2, 3 AND 4.

P. v., plica vocalis (true vocal cord); p. ventr., plica ventricularis (false vocal cord); v. l., ventriculus laryngis (Morgagnii); a. v. l., appendix ventriculi laryngis; M. ta., m. thyroarytenoideus; m. v., vocalis; g., glands; c., cartilage.

Figures are sections at middle third of true vocal cord near arytenoid and showing relation of m. thyroarytenoideus to vocal cord (Zeiss comp. occ. 4, obj. A2 outlined with camera lucida.

Macacus.

The true vocal cord is a blunt projection with thickened fibro-elastic tissue. The fibres of the thyro-arytenoid are separated from it by loose connective tissue. This muscle extends as one mass across from thyroid to arytenoid, and rises only slightly above the floor of the ventricle; it does not show any separate muscle bands extending into the ligamentum vocale. No muscle tissue is seen in the false vocal cord. In the false vocal cord

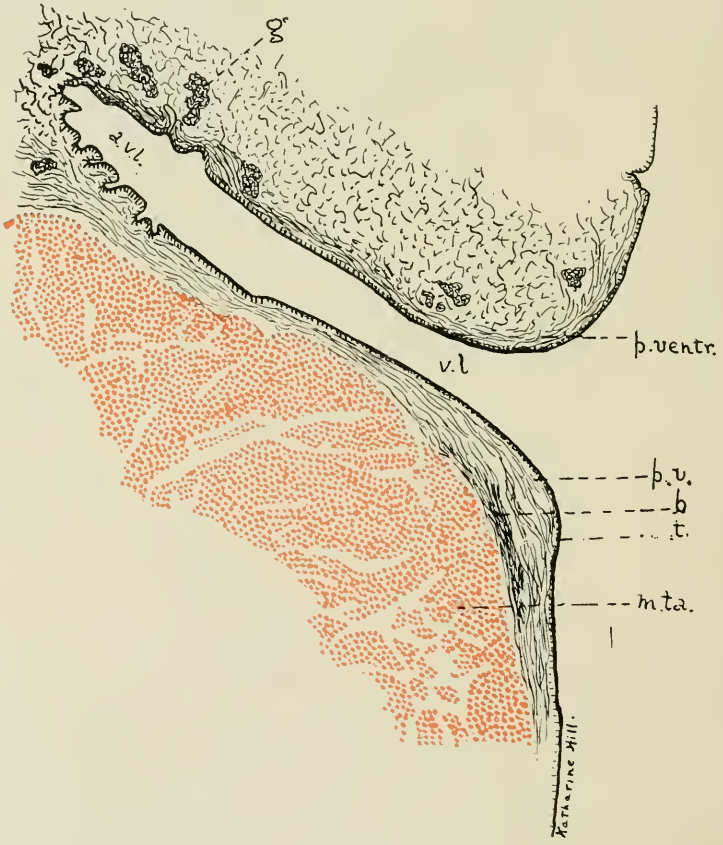


Fig. 2.

Macacus Phesus (family Cercopithecidae) b. thickened fibro-elastic tissue external to muscle with loose tissue superior to it.

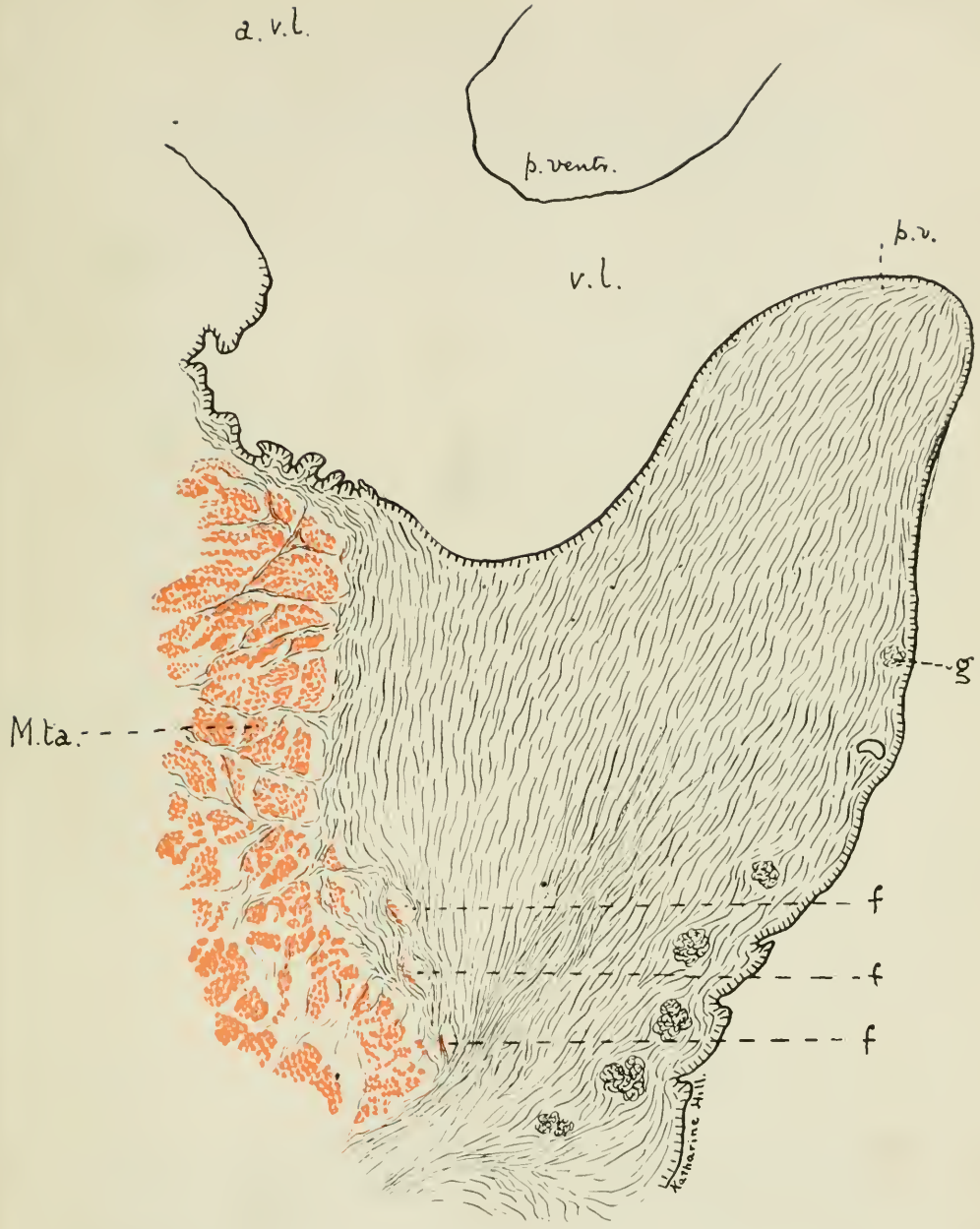


Fig. 3.

Young orang-utan, Simia satyrus (family Simudao), f. muscle fibres separating off from m. thyroarytenoideus and entering tissue of true vocal cord.

lies a mass of cartilage; imbedded in its connective tissue are several bundles of dense connective tissue, in which lie strands of elastic fibres. (Fig. 2.)

Simia Satyrus.

In the orang the muscle tissue lies well beneath and does not enter into the triangular prismatic mass which forms the vocal cord. The thyro-arytenoid is to be regarded as a compact muscle passing uninterruptedly from thyroid cartilage to arytenoid. The fibrous tissue which surrounds the muscle is, however, in closer relation to the elastic membrane than in the macacus, In some of the microscopic sections there appear strands of muscle fibers which enter between the fibers of the ligamentum vocale. These appear as distinct and separate muscle bands and suggest the distinct muscle bands which form so characteristic an appearance in the true vocal cord of man. (Fig. 3.)

Hominidae.

In the white races the main structure of the muscle is generally recognized. It takes *origin* from the middle line of the thyroid cartilage, from the crico-thyroid membrane, receiving a few fibers from the upper margin of the cricoid cartilage, where its lower border is in contact with the m. crico-arytaenoideus lateralis. Its fibers sweep up and back and have an *insertion* into the antero-lateral face of the arytenoid, its external border and muscular process, and into the point and inferior face of the processus vocalis. A number of the upper fibers reach the arytenoepiglottic fold and the epiglottis, constituting the m. thyreoepiglotticus.

For descriptive purposes the muscle is divided into two great but purely artificial divisions, namely, (1) m. thyreoarytaenoideus externus—the broad lateral band which sweeps above the level of the true vocal cord and lies in relation to the ventricle and appendix, and of which the m. thyreoepiglotticus forms a part. (2) m. thyreoarytaenoideus internus, or m. vocalis, a triangular prismatic mass whose medial surface lies adjacent to the ligamentum vocale and the conus elasticus, and which constitutes a considerable part of the vocal cord. (Fig. 4.)

There is no laryngeal muscle about which there has been so much dispute as the m. vocalis, especially in regard to its relation to the ligamentum vocale. A direct insertion into the ligamentum vocale is accepted among others by Ludwig, Kolliker and Henle; and denied by Luschka, Meyer and Kanthack. At

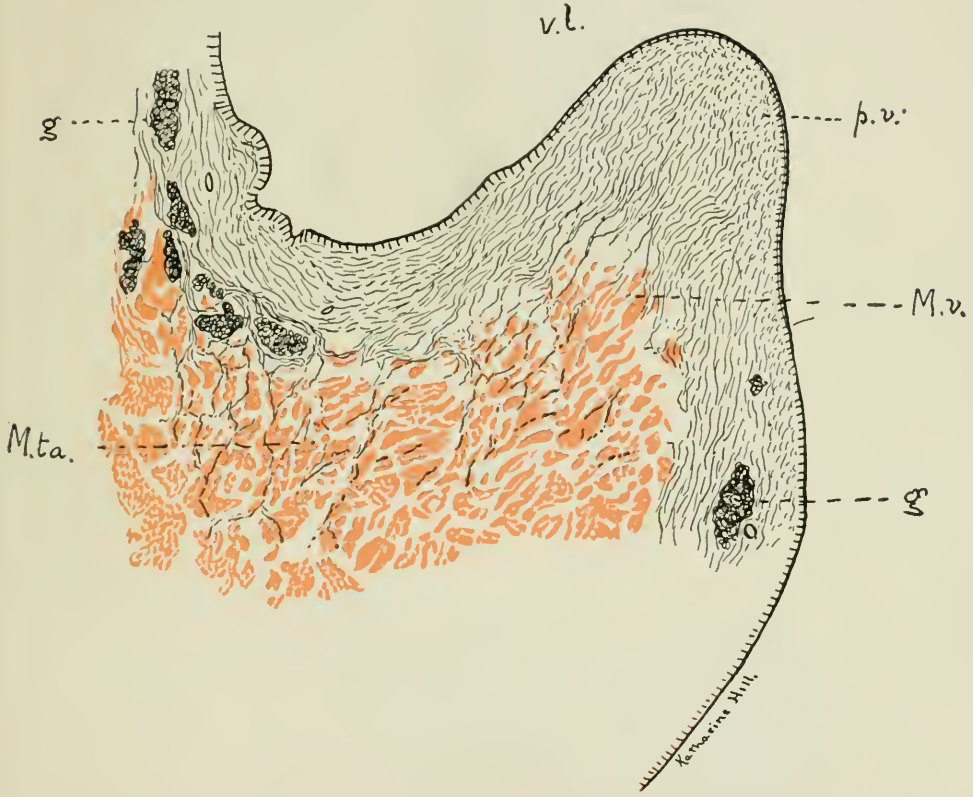


Fig. 4.

Hominidas—white man.

present the question is still an open one. But all are agreed in regard to the intimate relation of the m. vocalis to the cord.

An excellent review of the literature well up to date is given by Lewis.[8] He describes the fibers of the m. vocalis as passing in between the elastic fibers of the ligament and surrounded by them; but he never finds transition of muscle fibers into elastic

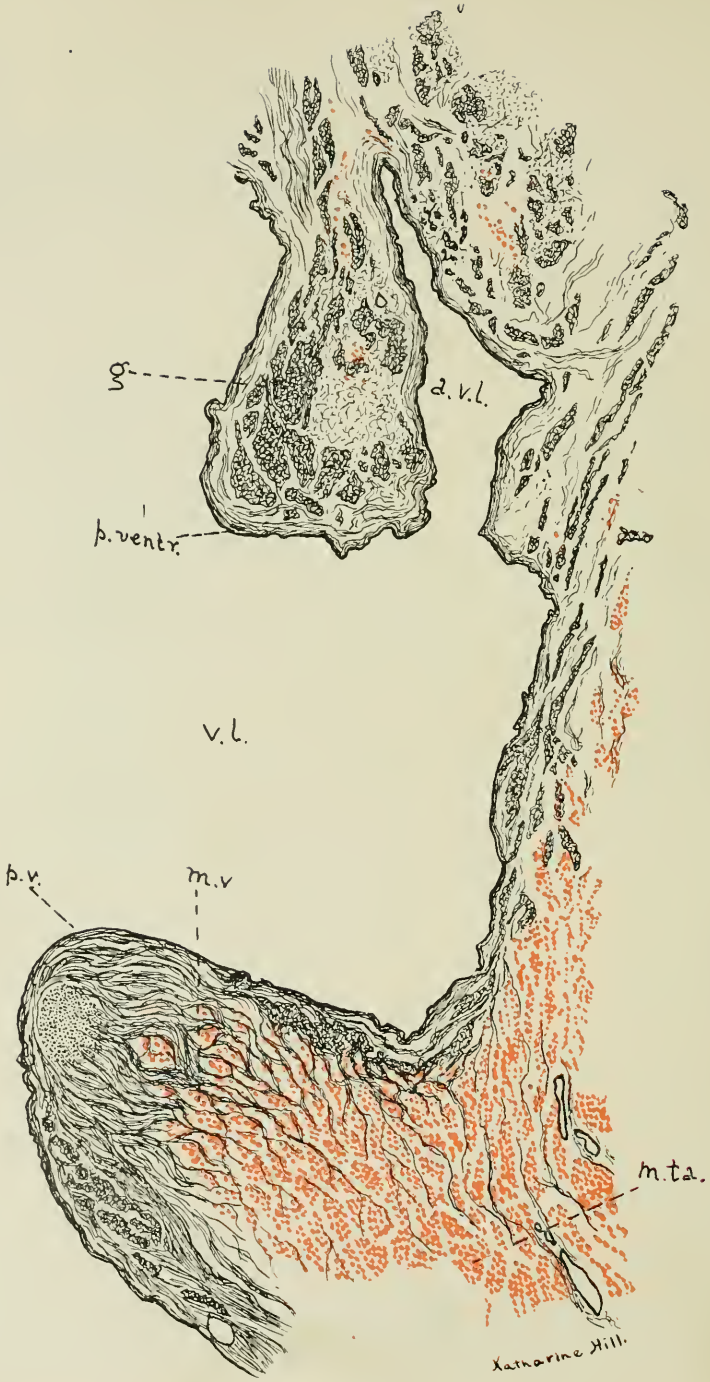


Fig. 5.

Hominidas—Chinaman. Section of true and false vocal cord with ventricle. (Zeiss comp. occ. 2, obj. A2, outlined with camera lucida.

fibers. The muscle fibers thus closely related to the elastic tissue of the ligamentum vocale may, he considers, by contracting, make tense the vocal ligament. Moreover, fibers of the ligamentum vocale are reinforced by additional fibers from the perimysium of the m. vocalis, and in this way the cord may be rendered tense. He suggests that these reinforcing fibers may act as follows: when the arytenoid is adducted, these fibres will abduct the cord and render it tense.

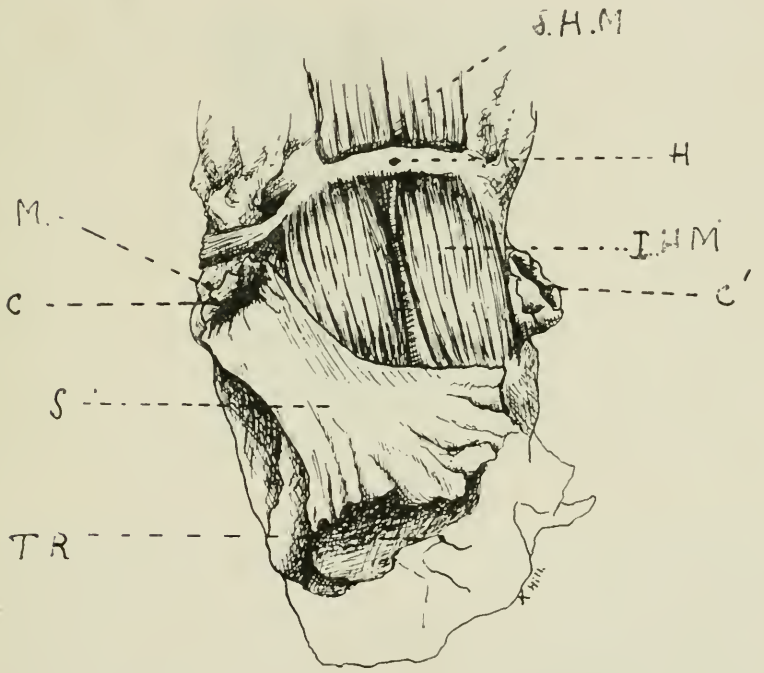


Fig. 6.

Communication between extra- and intra-laryngeal sacs of young Simia satyrus-orang utang. Whole of left extra-laryngeal sac cut away; part of right sac attached to deeper structures is seen extending slightly to left of middle line. C and C', openings in thryo-hyoid membrane between extra- and intra-laryngeal sacs of right and left side; S, part of right sac attached on its deeper surface; M, thyro-hyoid membrane; H, body of hyoid bone; I. H. M., infra hyoid muscles; S. H. M., supra hyoid muscles; T. R., 1^{m}, tracheal ring.

Chinaman.

The m. thyreoarytaenoideus projects into the true vocal cord and forms a well-marked m. vocalis, which, however, cannot be separated from the m. thyreoarytaenoideus (externus). The superior and medial fibers of the m. vocalis, especially near the arytenoid end, insinuate themselves well within the fibrous and elastic tissue of the true vocal cord. Some of these bands are relatively small, consisting of six to ten muscle fibres; others contain three or four times that number. The ultimate fate of these

Fig. 7.

Lateral extra-laryngeal sacs in man reproduced from "Ueber einen Kehlkopf des Menschen mit theilweise ausserhalb desselben gelagerten seitlichen Ventrikelsacken," by Dr. Wentzel Gruber. (Archiv f. Anat. Physiol. u. wissensch. Medicin, 1874, p. 604, Taf. XV., Fig. 2.) Y and Y', right and left extra-laryngeal sacs; A, cartilago thyreoidea; B, cartilago cricoidea; 2, corpus ossis hyoidei; 6, glandula thyreoidea; a, ligamentum hyothyreoideum medium; f, m. sternohyoideus (turned upward); g, m. omo hyoideus (turned upward); h, m. hyothyreoidus; i, m. sternohyoideus; k, m. crico thyreoideus; s, n. laryngeus superior; t, a. laryngea superior.

individual bands is hard to determine; they diminish in number and in size, and disappear in the tissue of the cord.

It was found impossible to compare accurately the relative size and relation to the ligamentum vocale of the m. vocalis in the white man and Chinaman. The different conditions under which

the tissue had been fixed and preserved had altered the parts considerably. Still, it appeared that in *this* Chinese larynx the m. vocalis was farther away from the apex of the true vocal cord, and that the muscle near the apex was more split into sections by the fibrous tissue. (Fig. 5.)

Functions of the Laryngeal Sacs.

Very varied are the opinions held in regard to the function of

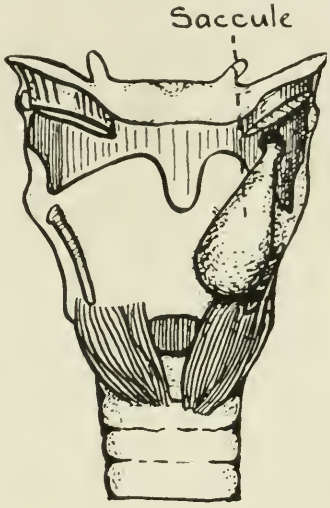


Fig. 8.

Extra-laryngeal sac in man from Sklavunos (reproduced from W. L. H. Duckworth's Morphology and Anthropology. University Press, Cambridge, England, 1904.

the appendices of the larynx, and we will not go far astray if we say that at present their physiological action is unknown. It is interesting to note the different opinions that have been put forward:

(1) It has been very generally held that they act as resonators. This seems to hold in regard to the median sac of Mycetes, the howling monkey, and to the varieties of Macacus which I have examined. In these animals the nature of the sac and its relation to the cavity in the hyoid seems adapted to act as a reson-

ator. In addition the mouth of the sac, lying in the middle line at the obtuse epiglottic laryngeal angle, gives further emphasis to this view. It is generally believed that the peculiar piercing cry of the howling monkey is due to this. But in the higher apes with soft sacs, with walls often extending to the clavicle and normally in apposition, it is not possible for them as act as resonators under ordinary conditions.

(2) Fraenkel[9] has suggested that in man one purpose is to pour secretion on the vocal cords, and so to keep them moist. However applicable this function may be in the white man with a horizontal floor, I can see very serious objections to the general application of such an hypothesis. I doubt its adequacy in the Chinaman I have just described, in the negro larynx as described by Gibbs, or in the apes. In these the floor often sinks below the level of the true vocal cord, and it appears to me the secretion would collect in the sulcus lateral to the cord. Moreover, in the apes the glands approximate so closely to the apex of the cord as to render such a secretion unnecessary.

(?) Vrolick[10] has suggested that the extra laryngeal sacs in the apes lighten the upper part of the body in climbing. An allied suggestion is that as the head of the ape is relatively heavy, we have it placed, as it were, on an air cushion, which takes a good deal of weight off the trunk and allows the animal to assume an erect position. Even were these suggestions suitable, their limitations to a few species would be detrimental to their general applicability.

(4) Deniker[11] believes that the extra-laryngeal sacs act as a protection for the vessels of the neck in the apes. He points out that the heavy face bones increase the pressure forward and so are apt to produce constriction of the cervical vessels.

Interesting as these suggestions may be, their applicability to only a few species seems to call for a general principle on which to base an hypothesis capable of explaining the presence of these widely distributed diverticula. It has always appeared to me that if any general principle underlies their presence and variable development, one must seek for such along the line of the general development of the larynx. Now, confining my attention chiefly to the anthropoidea as I have done in this paper, I

believe that the general development of the larynx has been progressive along the lines and satisfying the demands of interrelational life. If this be so, we ought to look in this principle for some explanation of the significance of these sacs.

Everyone recognizes that the cry of the animal is greatly modified by its emotional states. I would suggest that in emotional stress these inert sacs can be called into play, can be distended and modified in form. So there can be given to the vocal emission a tone of peculiar and significant intensity. In making this suggestion I do not forget the important role which may be played under such condition by the mouth, nose and nasopharynx. But I do believe that we have here, in the immediate neighborhood of the cords, structures which may undergo modifications most suitable for this purpose. I would suggest that in the laryngeal sacs we have analogous structures for analogous purposes to the oesophageal sacs of birds such as the pigeon which inflates the throat and crop when cooing to a mate or neighbor. To elaborate this suggestion would take one far beyond the limits of this paper. I, therefore, confine myself to two examples in the anthropoid apes which will exemplify my contention. The monkeys I have chosen are one from a New World family, Cebidae, and one from an Old World family, Simiidae. These two families are not only "absolutely distinct at the present day, but they have been, so far as we know, for a very long time, since no fossil remains of monkeys at all intermediate have been so far discovered." (Beddard [12].)

(1) It appears to me that there is sufficient evidence to show that the characteristic cry of the Mycetes, the howling monkey (family Cebidae) is not intended to frighten his enemies as is generally stated, but is used to modify the voice in order to express mental states and emotions.

Professor Tower of the Chicago University Biological Department, has kindly furnished me with some notes in regard to the howling monkey, the results of his observations of them in the forests of Central America. Since so few statements by competent observers are in the literature, and since Professor Tower's observations are not only of great interest, but so opposed to the usual statements in our text-books, I have dwelt on this more fully than is requisite for my particular purpose.

In the forest the monkey begins to howl about four in the morning, sometimes earlier, depending on whether the night is very warm or very cold, or if there is a bright moon. Usually it is an old male who starts when the forest is very still. He is answered from different directions by a second, a third or a fourth; very rarely two are howling at the same spot. So they cry backward and forward till about seven in the morning when the feeding activities of the day begin. The cry is not heard as a rule very long after sunrise. In the cool of the evening the howling is resumed. The cry is grutteral, not a shriek; it is like that of a man being throttled. It is not always the same note; the sounds emitted vary in range, in pitch and in individuality. This individuality is very marked. A monkey may utter six or seven sounds of different pitch, the whole lasting about thirty seconds and then being repeated. The others answer, each one varying these sounds.

The howling is most marked during the breeding seasons. The chief breeding season is in June, the young are born in December. The next or minor breeding season is in January. But breeding is not confined altogether to these two seasons, but is more generally diffused than in the lower mammals and approximates to man.

The attitude of the monkey when he howls is very characteristic; he raises himself up, fixes his arm on the limb of a tree, raises his head and howls. In other words, he appears to be fixing his extra-thoracic muscles. A gun shot will at any time stop the howl. It is very doubtful if the cry is heard at more than half a mile. Experience in hunting shows that one can usually locate the howler within a quarter of a mile. Of course a good deal will depend on the wind. Again, when one has been hunting in the forest the ear gets attuned to the forest so that any disturbance, even at a great distance, is felt rather than heard. So although one may not recognize the sound as a howl, still one may recognize a disturbing element in the air and education and experience does the rest.

(2) Our present evidence seems to point to the conclusion that the extra-laryngeal sacs of the Simia satyrus, orang-utan, (family Simiidae) are but rarely distended and then only under emotional stress. The sacs are never distended during forced

expiration. There are few direct and careful observations which have been published in regard to the distension of these sacs, but these support the statement that in captivity the extra-laryngeal diverticula are seldom distended and then only in emotional states. The following interesting observations are given by Meyer [13] in regard to the orang Rolff in the Zoological gardens in Berlin. "Unser Rolff blahte sich auf wenn er sich argerte und denjenigen schrecken wolte, welcher ihm Missvergnügen bereitete." In strong expiratory actions such as blowing up a fire, the extra-laryngeal sacs were never distended.

The Laryngocele and Extra Laryngeal Sac.

Connected with the varying size of the appendix is the question of the origin of the laryngocele and the lateral extra-laryngeal sacs in man. Are they pathological or are they a phylogenetic reversion? As is well known the laryngocele is an enlargement of the appendix which projects beyond the normal limits of this diverticulum for example into the sinus pyrformis or above the hyoid into the glosso-epiglottic fossa. The extra laryngeal sac is an enlargement of the appendix which projects through the thyro-hyoid membrane lateral to the thyro-hyoid muscle and lies under the platysma muscle. Of these the two classical examples in man are the double sac described by Gruber[4] and the single sac described by Sclavunos[5].

There appears to be sufficient evidence to suggest that certain enlargements of the appendix are pathological, *e. g.*, the presence of a tumor blocking the aditus laryngis causing the dilation of the ventricle. Included in this class must be the cases quoted by Larrey of the prevalence of laryngocele among those blind Mohammedans who are employed to chant verses of the Koran every hour of the day and night. But can one with Hanseman[14] dismiss the subject with the general statement that all are Missbildungen to be classed with hernia, due to a congenital or acquired weakening of the thyro-hyoid membrane and as a consequence dilatation subsequent to respiration. I would here remind you that *post hoc* is not necessarily *propter hoc*, and further, that such dilatations are not always accompanied by pathological lesions or with a history comparable to that given by Larrey.]

would ask you to consider that the close analogy these sacs have to those found in the primates, for example in the orang, suggests that they may be phylogenetic reversions. In this connection let me remind you that in the orang and gorilla the extra-laryngeal sacs are not present at birth; they are appendages which begin to appear in the early months of extra-uterine life.

In addition ontogeny throws some light on this question. It has been brought out by a study of the foetal larynx, especially by Sclavunos[15] and Bartel[16], that appendices are there always present, are always well developed and arise from the whole ventricular roof. In a large proportion they pass far above the upper border of the thyroid, even to the root of the tongue. In one case quoted by Sclavunos the dilatation occupied not only the glosso-epiglottic fossa, but the greater part of the sinus pyriformis. Normally a diminution occurs in extra-uterine life. There would, therefore, appear to be some justification for regarding them as a persistence of the foetal conditions and this would at once strengthen the hypothesis that some, at any rate, must be regarded as phylogenetic reversions. It is interesting here to note that the first case quoted of a laryngocele was in a deaf mute of forty years of age, which Rudinger, who described it, believed to be a case of phylogenetic reversion. As Bartels says, it is difficult to understand how the inarticulate cry of a deaf mute could produce a laryngocele.

M. Thyreo-arytenoideus.

In a comparative study of the musculature directly related to the cord, the outstanding facts appear to me to be a gradually increasing complexity of the m. thyreo-arytaenoideus and a closer approximation of it to the ligamentum vocale. The internal part of the muscle gradually enters into closer relation to the cord, finally becomes incorporated with it, and in man sends distinctly separated bundles into its fibro-elastic tissue which constitute the m. vocalis. In the marmoset and the macacus the m. thyreo-arytaenoideus is one compact muscle bundle lying apart from the vocal cord and not incorporated in it. In the orang this muscle approaches closer to the cord and a few muscle

bands are separated off and partly embedded in it. This is in complete agreement with Giacomini[17], who has shown that in the gibbon and chimpanzee this incorporation has advanced even farther and there begins more distinctly to be seen that characteristic appearance so distinctive of the muscle vocalis of man. When one studies the walls of the ventricle, there is noted in the marmoset no muscle tissue around the ventricle. In the orang muscle fibers pass around the inter-laryngeal portion of the ventricle. In man they are distinctly seen but apparently varying in amount in different individuals and it may be in different races, for in my Chinese larynx they are less abundant than in the white man of the corresponding age.

These facts suggest a function directly related to the true vocal cord and to its physiological activity. They show the development of a mechanism by which a finer or more exact control of the vocal apparatus can be obtained. This incorporation of the muscle in the cord will bring the activities of the cord directly under the control of the nervous system. If it be that the sacs can be used to vary the voice in states of emotion, how much more exact, how much more capable of development will such a muscular mechanism be?

From a comparative study of the larynx one fact appears to me clearly to stand out, namely, that we have here an organ whose recent phylogenetic history shows marked developmental progress and whose present state is that of great variability. The latter fact would itself suggest developmental activity. In this activity I feel that we do not realize as fully as we ought the important part which has been played and is still being played by the psychic state. We constantly recognize the important relation of sex to the vocal organs; but is not this but one aspect of the role played by the emotions? Is it not the case that mere words can never convey to us that finer expression of the emotions with which the voice can thrill us? And if this be so, must not this inevitably tend to further development of the larynx? In taste and in smell, and it may be in the eyes, we have a marked restriction of the peripheral distribution of the respective fields; but in voice, with its natural ally, speech, we have an expansion of the territory which is being utilized. Here

the progress is markedly forward and it may be that we shall yet be able to demonstrate subtile anatomical differences comparable to the higher physiological functions which it manifests in man.

I wish to express my indebtedness to one of my students, Miss Jeannette Obenchain, who has been associated with me in examining the various preparations.

Discussion.

Dr. J. Price-Brown: I am particularly interested in what the writer of this paper has said about laryngeal sacs. Some time ago I had the privilege of showing to the Toronto Academy of Medicine a most interesting case, which, for want of a better name, I called a "floating tumor." It occurred in a young woman twenty-five years of age. The tumor, located in the neck, was soft, would disappear on deep inspiration and fill by expiration. I concluded that it was a laryngeal sac, although I had no previous knowledge of the subject, and that it was filled by air. My confreres all differed with me and said that it was a thymus or thyroid gland and was drawn into the thorax during inspiration. Two things strengthened me in the belief that my own diagnosis was the correct one. First, that on deep inspiration the swelling would gradually and completely disappear behind the steinum. Second, the statement of the patient that she could always feel the air escaping during deep inspiration, and that she felt more comfortable when the finger was pressed upon the steinal notch, preventing the refilling of the sac. I would like to know from the reader of the paper what would be his opinion on the subject?

Dr. Wilson: In regard to laryngeal sacs, the question is an exceedingly interesting and complex one. From the description given by Dr. Price-Brown I should judge that the case described by him might well be an example of that rare abnormality, an extra laryngeal sac. Anatomically it would agree in position with such sacs as I have described. Clinically the variations in size with the respiratory movements, the disappearance with deep inspiration would aptly describe a diverticulum of the respiratory tract.

Bibliography.

1. Beddard, F. E. Mammalia. Cambridge Natural History. Macmillan and Co., London, 1909, p. XII.
2. Poirier et Charpy. Traité d'anatomie humaine. Paris. Masson et Cie., 1903. Vol. IV., Fasc. 2 p. 413.

3. Broesicke. Ueber einen Fall von medianem Ventriculus laryngeus tertius. Virch. Arch., Bd. 98, S. 342.
4. Gruber, W. Ueber einen Kehlkopf des Menschen mit theilweise ausserhalb desselben gelagerten Seitlichen Ventvikelsacken. Sacci ventriculares extra laryngei laterales. Arch. f. Anat. Physcol w. wissensch. Medicin, 1874, S. 606.
5. Sclavunos in Duckworth's Morphology and Anthropology, Cambridge, 1904, p. 375. Fig. 220.
6. Nicolas in Poirier et Charpy, loc. cit., p. 418.
7. Mayer, E. Ueber die Luftsacke der Affen und die Kehlkopfdivertikel beim Menschen. Arch. f. Laryngol. u. Rhinol. Bd. XII., 1902, S. 1-27. Tafel IV., Fig. 1.
8. Lewis, Dean. Jour. of Amer. Anat. Assoc. Vol. 4, 1905, p. 185.
9. Fraenkel, B. Der Ventr. Morg. Arch. f. Laryngol. Bd. 1, Berlin, 1894. Quoted by E. Mayer, loc. cit., S. 14.
10. Vrolick. Quoted by E. Mayer, loc. cit., S. 15.
11. Deniker. Quoted by E. Mayer, loc. cit., S. 15.
12. Beddard. Loc. cit., p. 555.
13. Meyer. Loc. cit., S. 15.
14. Hanseman, D. Untersuchungen über die Entwickelung der Morgagnischen Taschen. Arch. f. Laryngol., 1899. Bd. 9, p. 84.
15. Sclavunos, G. Ueber die Ventrikularsacke des Kehlkopfes beim erwachsenes und neugeborenen Menschen, sowie bei einigen Affen. Anat. Anz. XXIV., 1904, S. 511-523.
16. Bartels, P. Ueber die Nebenraume der Kehlkopfhöhle. Zeitschrift f. Morphol. u. Anthropol. Bd. VIII., 1905, S. 11-62.
17. Giacomini, Carlo. Annotazioni sulla Anatomia del Negro. Giornale della R. Accad. di Medicina di Torino, 1892 and 1897, p. 661-667.

THE SYNDROME OF SPHENOPALATINE-GANGLION NEUROSIS.

BY GREENFIELD SLUDER, M.D.

The sphenopalatine ganglion on its internal aspect lies, as a rule, close to the nasal mucous membrane, where it covers the sphenopalatine foramen. Lying in the pterygo-maxillary fossa, it is in close anatomical relation to the sphenoidal and post-ethmoidal sinuses above, with the maxillary sinus in front, and with the pterygoid process behind. Furthermore, as the pterygoid process is not infrequently hollowed out by a prolongation of the sphenoidal sinus downwards, as far as the bifurcation of the plates (as well as into the great wing), the ganglion is often also in close relation to the sphenoidal sinus posteriorly. In view of its close proximity to the mucous membrane of the nose, and to the several accessory sinuses, it is not surprising that the ganglion should be affected by inflammation in these cavities. In common with all sympathetic ganglia, it has a motor, a sensory, and a sympathetic root; some gustatory fibres seem also to pass through one of the roots. Remembering these complicated connections, it is also not surprising that the clinical manifestations arising from disturbances of this nerve centre should be multiform.

In three papers I have already described some of these manifestations.[1] I have also remarked that, by reason of its intimate anatomical relations, the pterygo-maxillary fossa may be regarded as tantamount to an accessory sinus of the nose, in so far as it may be affected by contiguity.

In this paper I should like, by assembling characteristic symptoms and signs, to formulate a syndrome, so far as I am able, of the manifold disturbances radiating from the sphenopalatine ganglion. In no single case have I seen all these signs and symptoms combined; although in every instance there have been defi-

[1]The Role of the Sphenopalatine (or Meckel's) Ganglion in Nasal Headaches, by Greenfield Sluder, M. D., New York Medical Journal, May 23, 1908.

nite indications pointing unmistakably to the ganglion as the centre of disturbance. My number of cases (sixty) is still small. Had a complete investigation been possible in all my cases the list might have been made much larger. My earlier observations were, however, directed primarily and mainly to the painful manifestations.

Clinical Course.—I have pointed out[2] that in these cases, when seen from the beginning, the pains of post-ethmoidal or sphenoidal disease have usually preceded the development of the characetristic neuralgic picture. I have also remarked that after the neuralgic manifestations have continued for some time (approximately four weeks) they begin to run irregularly, assuming the form of migraine, which may persist, even for years, after all local inflammatory conditions have disappeared.

Neuralgic Symptoms.—One of the most striking manifestations of disturbances in the sphenopalatine ganglion is the wide and characteristic distribution of pain along definite lines.

These neuralgic manifestations are evoked by mechanical irritation of the ganglion, by the Faradic current, and by therapeutic injections of alcohol. The clinical picture, as developed in connection with inflammation originating in the neighborhood of the ptearygo-maxmillary fossa is also that of pain, often of great severity. This neuralgia is described as a pain at the root of the nose, sometimes also in and about the eye, taking in the upper jaw and teeth, sometimes also the lower jaw and teeth and extending beneath the zygoma to the ear to take on the form of earache. It is emphasized at the mastoid; but is nearly always severest at a point about two inches posterior to the mastoid; thence, reaching backwards, by way of the occiput and neck, it may extend to the shoulder blade and shoulder, and, in severe attacks, to the axilla, arm, forearm, hand and fingers. This is the most frequent picture, as I have observed it. Sometimes a patient complains also of a "stiff" or "aching" throat, without inflammation; of pain, or oftener of itching, in the roof of the mouth; or of a pain inside the nose, which was once described to me as

[2]The Anatomical and Clinical Relations of the Sphenopalatine (Meckel's) Ganglion to the Nose and Its Accessory Sinuses, by Greenfield Sluder, M. D., New York Medical Journal, August 14, 1909.

"neuralgia; or, at least, were it not inside my nose I would call it neuralgia." Occasionally, the teeth have been said to be "sore" or "too long."

Sensory Signs.—In contradistinction to these painful symptoms, I have observed, on the affected side, an accompanying slight anaesthesia of the soft palate, and of the pharynx as far down as the lower part of the tonsil. This anaesthesia may be detected also in the anterior lower part of the nose. (These tests, made with a minute lock of loose cotton fibres, could not be applied farther back in the nose.)

Motor Signs.—In a very large percentage of my cases the neuralgia has been accompanied by motor disturbance affecting the configuration of the soft palate.

The palatine arch on the affected side is often, but not always, higher than on the well side.

The uvula is often deflected, from the affected side.

In the movement of the soft palate upward and backward, in the physiological act of closing off the throat from the nose, the median raphe is deflected from the affected side.

The dimple which forms just above the uvula during this act is displaced to the well side—normally it is in the median line.

Gustatory Changes.—Tests made with minute droplets of solutions of sugar, citric acid, common salt and bisulphate of quinine, applied simultaneously on both sides of the dorsum of the tongue in its middle third, have shown in almost every case a diminished and delayed perception of taste on the affected side. As a rule, this holds true for the four solutions alike; but occasionally the rule is broken, when perhaps three may be perceived more quickly and better on the well side, and one may be perceived better and more quickly on the affected side.

Three patients, either just before or during an attack of migraine, have shown a perverted sense of taste—described by two as "metallic," by the other as "a peculiar acid."

Four cases were accompanied by salivation, described by two patients as on the affected side.

Three cases were accompanied by great sneezing, with profuse serous secretion resembling that seen in rhinitis nervosa.

Treatment.—The neuralgic symptom complex can generally be

relieved by the application of cocaine to the nasal mucous membrane covering the sphenopalatine foramen. In some cases relief follows a single application of a drop of a 20 per cent solution. In other cases it may be necessary to make as many as three applications of a saturated (67 per cent) solution (one drop on each applicator), soaked for ten minutes into the tissues. In some recent cases of moderate severity this treatment is curative—that is, the application of cocaine stops the pain, and it does not come back.

In moderate to severe cases of longer duration—that is, up to nine months—injections of alcohol into the ganglion have proved curative; as many as three injections having been found necessary in most cases.

Even in the severest chronic cases cocaine affords temporary relief at the time of an exacerbation; the pain usually returning after an hour, but in diminished severity. The relief following the injection of alcohol into the ganglion often persists for months, but as the latent neuralgia may be rekindled at any time by an attack of corhyza, the cure cannot be regarded as definitive.

Throughout my observation of these cases the question has often arisen whether the cocainizing of the ganglion itself was necessary, or whether an application to any point in the nose might not also give the same result; also whether the relief were not in part at least referable to the exhilarant toxic effect of cocaine.

To remove any doubt on these points I have frequently cocainized other areas in the nose to an extent sufficient to get pronounced general intoxication. When this test was made on a subject who had never before been treated as a nose patient (that is, who, although only too familiar with the neuralgia, had never been examined by a rhinologist), the result was uniformly negative. But when the application was made at the site of the sphenopalatine foramen the relief was complete, or nearly so, according to the severity of the pain and the quantity of cocaine soaked into the tissues. This has also been the story in the case of patients whose noses had been repeatedly cocainized in the treatment of sphenoidal and post-ethmoidal inflammations, but who had only recently developed sphenopalatine neuralgia. When

other areas were cocainized the result was negative—when the sphenopalatine area was cocainized the pain stopped.

In some of these neuralgias of greater intensity this relief when first experienced is almost startling. The impression produced upon the patient is so profound that it usually leaves him open to suggestion, at least on the part of his physician. Later, when another attack begins, he promptly seeks relief in fullest confidence that it will be obtained. In a mild recurrent attack cocainization of almost any part of the nasal mucous membrane may afford relief, but in such cases I have also tried normal saline solution with equal apparent benefit. In a severe attack I have not been able to stop the pain except by cocainizing the ganglion area.

I herewith submit some notes of cases, each illustrative in its way.

Case 1: Miss S., twenty-seven years old, consulted me June 13, 1906. For many years, "off and on," she had suffered from pain in the head, which she described as paroxysmal, beginning at the root of the nose, involving the upper jaw and teeth (occasionally also the lower jaw and teeth), extending backward to the tip of the mastoid, and intensest about 5 cm. posterior to this point.

These paroxysms recurred sometimes two or three times a week; and, when at her best, at intervals of two or three months. Examination of the nose was negative in every particular. She made the observation, however, during an attack, that the spraying of the nose with cocaine, in a four per cent. solution, had relieved her of much of her pain.

In the absence of a definite diagnosis, but continuing the spraying of the nose with cocaine, it was found that each application appreciably mitigated the pain. Under this treatment, in apparently much improved condition, she passed from observation. About three months later she returned for treatment of a severe corhyza, which in two days localized itself in a suppurating inflammation of the post-ethmoidal and sphenoidal sinuses of both sides. Almost simultaneously the old pain reappeared on the left side, involving the root of the nose, the cheek, the mastoid tip and a little behind it, the neck, shoulder blade, shoulder and arm—all in great severity.

Remembering the position of Meckel's ganglion, in close

proximity to these sinuses, and the wide distribution of its branches and connections, it occurred to me that this distribution of pain might be due to the inflammation or its products extending to or acting upon the ganglion; and, if this was true, that cocaine applied (soaked) over the sphenopalatine foramen might probably prove effective in at least mitigating its severity.

The experiment was tried, and succeeded even beyond expectation. Since then I have applied the cocaine at the same site in severe recurrent attacks, probably twenty times, always relieving the pain and usually aborting the attack.

I have also done some experimenting in these cases, but particularly in this case. During an attack an application of a single drop of four per cent. solution of cocaine to the nose in the area overlying the ganglion was followed by only the faintest relief. This dilute solution was then replaced by a drop of a ten per cent. solution, with greater relief. A drop of a twenty per cent. solution was then applied with further lessening of the pain. A drop of a saturated solution (about sixty-seven per cent.) was then applied, when the relief would usually become complete. Applications to other areas gave negative results. In very severe attacks the pain would stop except at a point 5 cm. posterior to the tip of the mastoid, where, although greatly mitigated, it never quite disappeared, a very slight pain always persisting at this site. The applications were allowed to remain twenty minutes in position.

This patient suffered greatly from repeated attacks until December 1, 1908, when I began injections of alcohol, making the attempt to put the alcohol into or in direct contact with the ganglion. A straight needle directed upward and outward under the posterior fourth of the middle turbinate will reach the sphenopalatine fossa, just where the ganglion lies. The needle must, however, be passed obliquely through the lateral wall of the nose, which in this case was so hard as to make the procedure impossible. I thereupon drilled through the bone, thus removing the obstacle to the passage of the needle into the pterygo-maxillary fossa and opening an easy route for subsequent injections. The injection of the alcohol aggravated the characteristic pain already described, but the exacerbation was transitory and was followed by relief.

After a course of ten injections the relief seemed complete; but, after somewhat more than three weeks of freedom from pain, the patient contracted another severe coryza, with suppurative inflammation of the post-ethmoidal and sphenoidal cells on both sides, rekindling the old pain, now for the first time appearing also on the right side, although with less severity than on the left side. One application of saturated cocaine solution, posterior to and slightly above the posterior tip of the right middle turbinate, stopped the pain, and it did not recur. On the left side relief was more tardy.

Miss S. had recently another "explosion," which was greatly relieved by one drop of saturated cocaine solution applied to the ganglion area, but a rather severe pain still persisted in the shoulder blade on the same side. The next day the cocaine application was repeated, with complete relief of the pain.

The history of this case to March 2, 1909, was reported by me last year[3]. Since then she has been better and worse. Four more injections of alcohol have been administered. One in particular, on July 8, 1909, caused most violent pain throughout the entire area of distribution as above described. Two days later she said that this injection had given the most relief of any. On October 25th she again appeared, suffering from an attack of coryza with post-ethmoidal and sphenoidal suppuration on both sides. Two days later she developed an intense characteristic neuralgia extending down to the tips of the fingers. In this attack the pain also ran down the back and into the legs and feet. November 26th I again injected alcohol into the (left) ganglion. While the needle was still in position I connected it to one of the electrodes of a Faradic coil and had her hold the other in her right hand. Despite the profound cocainization this electrical excitation evoked a painful reaction along the lines of the neuralgic distribution.

About this time I made a series of critical observations of the motor, sensory and gustatory complications. The arch of the soft palate had always been and still remained markedly higher

[3]Further Clinical Observations on the Sphenopalatine Ganglion (Motor, Sensory and Gustatory), by Greenfield Sluder, M.D., New York Medical Journal, April 23, 1910.

on the left side. The uvula was deflected to the right. The soft palate and the pharynx down to the level of the lower part of the tonsil were somewhat less sensitive on the left side to contact with a lock of loose cotton. There was also slight anaesthesia at the floor of the left nostril anteriorly. In the middle and anterior third of the tongue the sense of taste for sugar, sodium chloride, citric acid and quinine bisulphate was less acute on the left side than on the right.

Two intense exacerbations in the Winter of 1909-10 decided me to attempt the removal of the sphenopalatine ganglia. February 7, 1910, having elected to operate first on the right side, I removed the middle turbinate in order to afford free access to the area over the pterygo-maxillary fossa. She stood this preliminary operation remarkably well in every way. March 15, 1910, under cocaine, I tore out the lateral wall of the nose anterior to and above and below the sphenopalatine foramen, and, with a side-biting forceps, removed a mass of soft tissue of the size of a large pea. I also opened the post-ethmoidal and sphenoidal sinuses. She stood the operation well. It was nearly painless. Three hours later she began to vomit, the vomiting continuing for four days. For the next three weeks she complained of persistent nausea.

The day after this operation I tested her sense of taste and found it better on the left side (middle third of tongue) than on the right. Prior to the operation it had been less acute on the left side. Sensation was also better on the left side than on the right. Previously it had been less acute on the left side. The arches of the palate were nearly symmetrical, although the left remained somewhat higher than the right. The characteristic deflection of the raphe with displacement of the dimple above the uvula, to the right side, was still manifest.

Six days after the operation she developed an acute sore throat with a temperature of 103° F. The inflammation spread upward and infected the wound, rekindling the old neuralgia in great severity. This intercurrent neuralgia passed off in the course of the next two weeks, and there has been no return of pain[4] on the

[4]June 17, 1910.

operated (right) side. On the left side there has been no change from previous conditions.

Examination by Dr. C. M. Byrnes, of Baltimore, of the specimen removed from the pterygo-maxillary fossa showed no ganglion tissue.

Case 2. Mrs. G. C., aged sixty-seven, consulted me December 14, 1908, for what she described as "a peculiar sort of a cold," of one week's standing. Besides a slight neuralgia in the upper jaw and occiput, she complained of a harassing itching of the palate, and of sneezing, with watery secretion, which began in the early morning and ceased by noon. In the afternoon and evening she was free of all symptoms except the neuralgia. Examination showed the area of the right sphenopalatine foramen markedly redder than the left. Six applications of one-half per cent. formaldehyde solution, made in the course of ten days, restored this congested area to a normal appearance, with cessation of all the symptoms. There has been no recurrence.

Case 3. Mrs. W. S., thirty-eight years old, and highly neurotic, consulted me February 20, 1907, for acute lingual tonsillitis, from which she recovered in a few days. She had no other nose or throat trouble. I did not see her again until October 1, 1909, when she returned, complaining of pain inside her left nostril. Examination of the nose was in every way negative. She said she had not had a coryza, and had not had anything wrong in her nose until this pain began, two days before. The pain continued, in spite of local applications, for three weeks, when it culminated in an explosive neuralgia extending on the left side to the tips of the fingers and down the left leg. Despite liberal doses of phenacetin and codein, taken on her own initiative, the pain of this attack surpassed everything that is usually accepted as the limit of physical suffering.

Examination of the nose during this attack was still negative. Because of the distribution of the pain in the maxilla, ear, mastoid, occiput, neck, shoulder blade, shoulder, arm, forearm, hand and fingers, I felt that it must proceed from the sphenopalatine ganglion. A first attempt to cocainize the ganglion was unsuccessful owing to a slipping of the cotton carrying the solution (sixty-seven per cent.) away from the site of the sphenopalatine foramen. Although it was soaked into the tissues for fifteen minutes the cocaine did not relieve the pain. A second application, made at the site of the sphenopalatine foramen, was followed by some

relief, and two more applications, made at the same site, stopped all the pain, including that which extended down the leg. After twenty minutes of complete relief the pain began to return, but it remained very much less severe and was now controllable by phenacetin and codiene. She was well again in five days. She had previously had attacks of pain in different parts of her body, but never "anything of this kind."

Her palate arches had been symmetrical until the occurrence of the explosive attack. The day after the "explosion" the left arch was found to be much higher than the right and it remained so for approximately two weeks, when they became even. There was also slight anaesthesia of the left side of soft palate, pharynx and anterior lower part of nose. No gustatory observations were made.

Case 4: Mrs. L. E. S., thirty-eight years old, consulted me March 31, 1909, for pain behind the right eye. Her nose showed a post-ethmoidal suppuration on that side. It rapidly yielded to treatment without operation—the suppuration and pain stopped. During the Summer she contracted a corhyza, probably reinfecting the post-ethmoid. A little later neuralgia, recognized from her description as of the sphenopalatine type, set in on the right side. She consulted me the second time, February 28, 1910. At that time she had no sinus involvement, but showed three large veins over the sphenopalatine foramen with redness and slight swelling of the mucous membrane. She complained of a return of the neuralgia, and of much sneezing, with profuse serous secretion in the early morning. She thought the sneezing started in the right nostril. Her sense of taste was the same on both sides for sugar and salt, but was better for acid and bitter on the right than on the left side. The right palate arch was higher than the left. The anterior part of the nose and the soft palate showed slight anaesthesia (to cotton fibres) on the right side. A few applications of one-half per cent. formaldehyde sufficed to restore the area of the sphenopalatine foramen to an apparently normal condition, with cessation of the pain and sneezing. The motor, sensory and gustatory reactions remain unchanged.

Two new drawings, representing particular anatomical relations, which I have not hitherto shown, are appended.

Figure 1 is from a specimen in which the pterygo-maxillary fossa is bounded anteriorly by a thin plate of bone separating it from a post-ethmoidal cell.

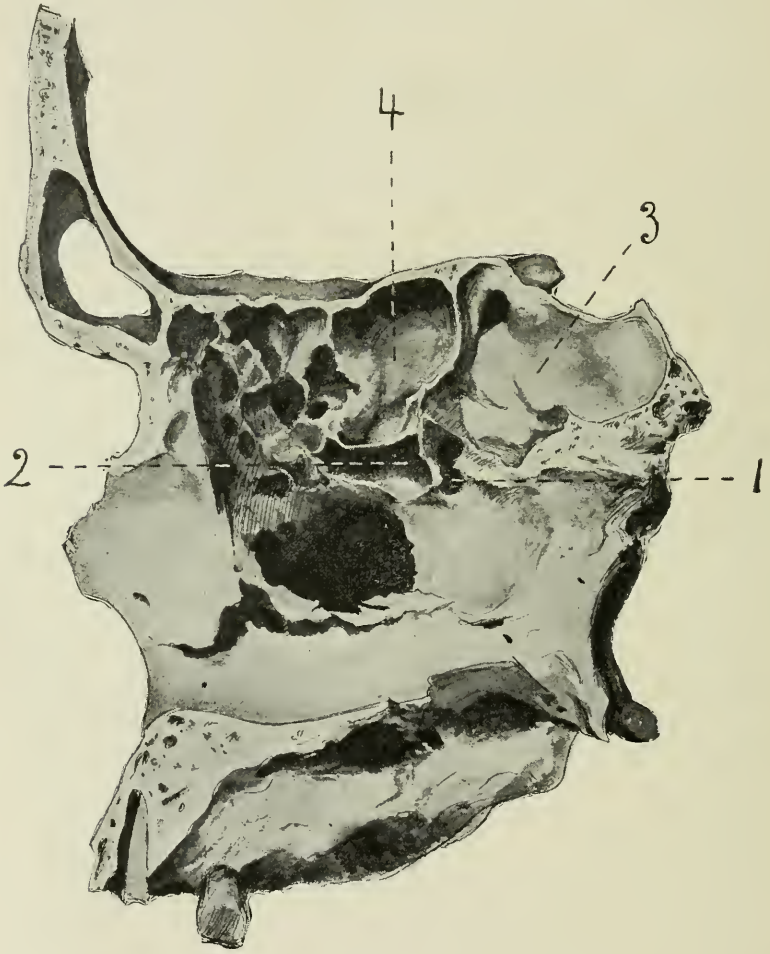


Fig. 1.

1 Sphenopalatine foramen. 2 Post-ethmoidal cell. 3 Sphenoidal sinus. 4 Post-ethmoidal cell.

Figure 2 is from a specimen in which the pterygo-maxillary fossa is bounded anteriorly by a thin plate of bone separating

it from a prolongation of the sphenoidal sinus downward into the bony posterior wall at the apex of the maxillary sinus.

In ten (10) cases of glaucoma the occular pain has been controlable by cocaine applied to the sphenopalatine foramen.

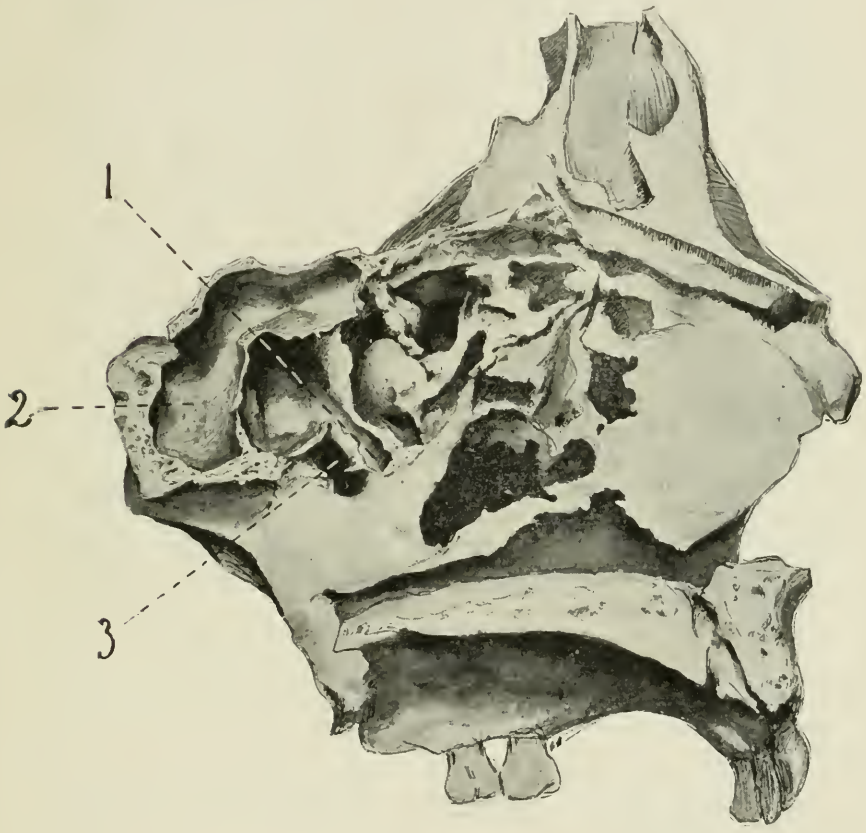


Fig. 2.

1 Sphenoidal sinus. 2 Sphenoidal septum deflected to the left. 3 Sphenopalatine foramen.

Discussion.

Dr. H. P. Mosher: For some time I have had a theoretical interest in the sphenopalatine ganglion, but last year when Dr. Sluder read his paper in Boston and demonstrated his specimens

my interest in the ganglion became a practical one. At that time I asked Dr. Sluder if he had cauterized the ganglion in vaso-motor cases. He replied that he had not. During the last year I have had some experience in cauterizing the sphenopalatine ganglion in vaso-motor cases and in cases of asthma. My experience can be summarized as follows: One case of intractable vaso-motor rhinitis of years standing was given a year's relief and of three cases of asthma one was stopped for a week, one for two weeks and one for two months. Dr. Sluder has given us the first complete description of the sphenopalatine ganglion, but he is not the first to describe the prolongations of the sphenoidal sinus. The prolongations of the sinus, even the one into the pterygoid process have been described by others.

Dr. J. Gordon Wilson: The most interesting part of this paper to me is the association of definite nasal symptoms with lesions affecting a sympathetic ganglion. The changes in vaso-motor and secretory disturbances which Dr. Sluder has described are important and suggestive; but the gustatory phenomena which he finds are difficult to reconcile with our present accepted anatomical knowledge of the course of these fibres. The results of the testing for taste in the anterior part of the tongue are subject to so much variation in healthy individuals that the opinion of most men who have worked on this subject, such as Gowers and Cushing, is that to obtain reliable results taste must have been carefully tested before as well as after the operation. The absence of such a record appears to me to lessen the value of Dr. Sluder's findings.

Presentations of Specimens and Instruments.

During the scientific sessions of the Congress the following specimens and instruments were presented:

Dr. Wilson, in connection with Dr. Mayer's paper, the larynx and esophagus of a young lion, showing a diverticulum of the esophagus.

By Dr. Shambaugh—Microscopical slides illustrating his paper (p. 206).

By Dr. Sluder—Cross sections of the bony skull, showing the anatomical relations of the sphenopalatine ganglion (p. 234).

By Dr. Delavan—A respirator to be worn in motoring (p. 126).

By Dr. Mosher—Instruments illustrating direct intubation (p. 52) and charts illustrating exostoses of the accessory sinuses (p. 64).

By Dr. Coffin—Charts and skiagrams illustrating his paper (p. 156).

By Dr. Ingersoll—Pictures illustrating the turbinate regions of an ape and a seal.

By Dr. Richardson—A mounted specimen of the laryngeal growth referred to in his paper (p. 189)

Dr. Chevalier Jackson exhibited a new forceps for seizing open safety pins when lodged point upward in the esophagus. The forceps, while holding the pin securely, permitted free turning of the pin, so that it could be carried down into the stomach, turned there and removed safely.

AMERICAN LARYNGOLOGICAL ASSOCIATION.

Business Meeting.

The Thirty-second Annual Congress of the American Laryngological Association was held in Washington, D. C., on May 3, 4 and 5, 1910, in connection with the Eighth Triennial Congress of American Physicians and Surgeons. The sessions of the Association were held in the ballroom of the Shoreham Hotel. The opening meeting occurred on Tuesday, May 3, and was called to order at 10 a. m. by the President, Dr. James E. Logan, of Kansas City, Mo. During the various meetings the following Active Fellows were registered:

Dr. W. L. Ballenger, Chicago, Ill.
Dr. T. P. Berens, New York City.
Dr H. S. Birkett, Montreal, Canada.
Dr. J. Price-Brown, Toronto, Canada.
Dr J. H. Bryan, Washington, D. C.
Dr. W. E. Casselberry, Chicago, Ill.
Dr. J. Payson Clark, Boston, Mass.
Dr. C. G. Coakley, New York City.
Dr. F. C. Cobb, Boston, Mass.
Dr. L. A. Coffin, New York City.
Dr. J. Solis-Cohen, Philadelphia, Pa.
Dr. A. Coolidge, Jr., Boston, Mass.
Dr. D. Bryson Delavan, New York City.
Dr. W. J. Freeman, Philadelphia, Pa.
Dr. Richard Frothingham, New York City.
Dr. A. C. Getchell, Worcester, Mass.
Dr. J. L. Goodale, Boston, Mass.
Dr. C. P. Grayson, Philadelphia, Pa.
Dr. D. C. Greene, Jr., Boston, Mass.
Dr. T. H. Halsted, Syracuse, N. Y.
Dr. J. H. Hartman, Baltimore, Md.
Dr. Frank Hyatt, Washington, D. C.

Dr. E. Fletcher Ingals, Chicago, Ill.
Dr. J. M. Ingersoll, Cleveland, Ohio.
Dr. Chevalier Jackson, Pittsburgh, Pa.
Dr. Samuel Johnston, Baltimore, Md.
Dr. D. Braden Kyle, Philadelphia, Pa.
Dr. G. A. Leland, Boston, Mass.
Dr. William Lincoln, Cleveland, Ohio.
Dr. J. E. Logan, Kansas City, Mo.
Dr. J. H. Lowman, Cleveland, Ohio.
Dr. A. W. MacCoy, Philadelphia, Pa.
Dr. J. N. Mackenzie, Baltimore, Md.
Dr. G. H. Makuen, Philadelphia, Pa.
Dr. Emil Mayer, New York City.
Dr. J. F. McKernon, New York City.
Dr. H. P. Mosher, Boston, Mass.
Dr. R. C. Myles, New York City.
Dr. J. E. Newcomb, New York City.
Dr. F. R. Packard, Philadelphia, Pa.
Dr. N. H. Pierce, Chicago, Ill.
Dr. B. A. Randall, Philadelphia, Pa.
Dr. W. S. Renner, Buffalo, N. Y.
Dr. G. L. Richards, Fall River, Mass.
Dr. C. W. Richardson, Washington, D. C.
Dr. J. O. Roe, Rochester, N. Y.
Dr. G. E. Shambaugh, Chicago, Ill.
Dr. B. R. Shurly, Detroit, Mich.
Dr. W. K. Simpson, New York City.
Dr. Greenfield Sluder, St. Louis, Mo.
Dr. H. L. Swain, New Haven, Conn.
Dr. C. F. Theisen, Albany, N. Y.
Dr. J. G. Wilson, Chicago, Ill.
Dr. J. R. Winslow, Baltimore, Md. Total—55.

The Annual Address was delivered by the President, Dr. Logan, and the programme assigned for the morning was followed as far as time permitted. At 12:30 p. m. the Association went into executive session. The election of new members was first in order. There were no candidates for Active Fellowship. For Honorary and Corresponding Fellowship the following

gentlemen were voted for, Drs. Frothingham and Goodale acting as tellers:

Honorary—Dr. Ottakar Chiari, representing Austria; Dr. E. J. Moure, representing France, and Dr. Ferdinando Massei, representing Italy (all advanced from the Corresponding list).

Corresponding—Dr. E. von Navratil, Buda-Pesth, proposed by Drs. Coakley and Gleitsmann, and Dr. L. Réthi, Vienna, Austria, proposed by Drs. Gleitsmann and Birkett.

The tellers reported the election of all the above gentlemen.

Drs. Birkett and Shurly were appointed Auditing Committee to examine the Treasurer's books.

The election of a Nominating Committee to prepare a list of officers for the ensuing year resulted in the choice of the following: Chairman, Dr. Bryan, and, in addition, Drs. Simpson, Cobb, Pierce and Makuen.

At 1 p. m. the Congress adjourned, and with the ladies enjoyed the hospitality of Dr. Bryan at his residence, No. 1644 Connecticut avenue, meeting there the Fellows of the Otological and Climatological societies.

In the afternoon a session of the Triennial Congress was held. In the evening a reception was given by Dr. and Mrs. Logan at the New Willard Hotel to the Fellows and their ladies.

The Association met on the second morning, Wednesday, May 4, at 9:30 o'clock, in executive session. The report of the Secretary was read and accepted.

Secretary's Report.

During the year now closing there has been one resignation from Active Fellowship (that of Dr. Frank L. Ives, of New York City) and one death (that of Dr. Gordon King, of New Orleans, La., which occurred in that city as the result of an accident in polo playing on March 26 of this year). The election of yesterday brings our present membership to the following numbers: Honorary, 5, with 10 vacancies; Corresponding, 22, with 8 vacancies, and Active, 87, with 13 vacancies.

The Transactions of 1909 appeared in November of that year, and a copy is herewith formally presented to the Associa-

tion. The usual number were distributed to institutions throughout the world, and a few were sold at a cost to the purchaser of $2.85, this being the net cost to the Association, including delivery.

There has been one meeting of the Council held during the year, the minutes of which will now be read.

. . . . . .

In the month of June, 1909, a letter was received from a committee of the Berlin Laryngologische Gesellschaft and signed by Dr. Arthur Rosenberg, of that city, to the effect that our Honorary Fellow, Professor Dr. B. Fraenkel, would, on the 16th day of July, 1909, celebrate the fiftieth anniversary of his graduation in medicine and inviting this Association to make such acknowledgment thereof as it might see fit. The following letter was sent by the Secretary:

New York, June 30, 1909.

Professor Dr. B. Fraenkel, Berlin:

To Professor Dr. B. Fraenkel the Council and Fellowship of the American Laryngological Association present their hearty congratulations on the approaching celebration of the semi-centennial of the award to him of the degree of Doctor in Medicine.

His long life, spent in the service of his fellow-men, his invaluable contributions to scientific medicine, his work in the propaganda against tuberculosis, his unfailing courtesy to his colleagues and the lofty type of his personal character, alike endear him to his professional associates and to the world at large.

May his life be still lengthened out for the carrying on of its beneficent activities.

By direction of the Association,

(Signed) James E. Newcomb, M. D.,
Secretary.

Professor Fraenkel sent to your Secretary the following letter:

den 26 Juli, 1909.

An die American Laryngological Association, zu Haenden des Herrn, Dr. James E. Newcomb, New York:

Die American Laryngological Association hat mir durch den

freundlichen Glueckwunsch zu meinem fünfrigjahrigen Doctor-Jubilaeum eine ganz besondere Freude bereitet.

Indem, ich Ihnen die gehabte Muehe besteus danke, bitte ich der American Laryngological Association meinem verbindlichsten Dank fuer die hohe mir zu Teil gewordene Auszeichnung ausdrucken zu wollen.

Mit aller Hochachtung, ganz ergebenst,

B. Fraenkel.

The various items of business which have been considered by the Council during the past year and still call for official action will come up later, in the usual course of business.

Respectfully submitted,

(Signed) James E. Newcomb,
Secretary.

Treasurer's Report for the Year Ending May 1, 1910.

RECEIPTS.

Balance from old account	$463.38
Loan, Corn Exchange Bank	400.00
Received from candidates for illustrations of Theses	7.50
Arrears of dues	80.00
Current dues	800.00
Exchange on checks	.20
Sale of Transactions	23.33
Total	$1,774.41

EXPENDITURES.

Dr. Farlow, on account of de Roaldes prize	$25.00
Dr. Clark, on account of extra dinner expenses, 1909	25.00
Stenographer, 1909	100.00
Printing report of Committee on Nomenclature	18.50
Illustrations for Theses	7.50
Transactions, 1909	656.96
Repayment on bank loan	400.00

Interest on bank loan	4.13
Programmes and distribution, 1910	30.00
Printing and stationery	45.80
Expenses of office of Secretary and Treasury	15.13
Total	$1,328.02
Balance to new account (bank balance)	$446.39
Total	$1,774.41

STATEMENT OF ASSETS AND LIABILITIES.

ASSETS.

Invested—de Roaldes Prize Fund and accumulated interest per account No. 202,169, Franklin Savings Bank, New York City, in name of Treasurer		$552.02
Current—Unpaid dues	$120.00	
Postage in office	2.30	
Bank balance	446.39	568.69
Total		$1,120.71

LIABILITIES, NONE.

Respectfully submitted,

(Signed) JAMES E. NEWCOMB, Treasurer.

Washington, D. C., May 4, 1910.

Audited and found correct,

(Signed) B. R. SHURLY,
H. S. BIRKETT,
Auditing Committee.

Librarian's Report.

Washington, D. C., May 4, 1910.

Gentlemen—Since the last meeting there have been only eleven unbound and two bound volumes received by the librarian. These, as soon as possible, will be deposited in the library of the Surgeon-General of the United States Army.

Respectfully submitted,

J. H. BRYAN, Librarian.

The report of the Committee on Nomenclature was then presented. It was voted that if it shall be adopted by the American Otological Society, the American Laryngological, Rhinological and Otological Society and the Section on Laryngology of the American Medical Association, it shall be adopted by this Society and printed in the Transactions.

The Nominating Committee, through its Chairman, Dr. Bryan, submitted the following report:

For President, Dr. D. Braden Kyle, Philadelphia, Pa.; First Vice-President, Dr. Robert C. Myles, New York City; Second Vice-President, Dr. John M. Ingersoll, Cleveland, Ohio; Secretary and Treasurer, Dr. James E. Newcomb, New York City; Librarian, Dr. Joseph H. Bryan, Washington, D. C.; Member of Council, Dr. James E. Logan, Kansas City.

The President, Dr. Logan, appointed Dr. Delavan to fill the vacancy on the de Roaldes Prize Committee occasioned by the death of Dr. King.

A Committee consisting of Dr. Coakley, Chairman; Dr. Coolidge and Dr. Swain was appointed to revise the Constitution and present its report at the next meeting.

The abolition of the waiting list, as announced in the minutes of the Council, was then taken up and considerable discussion ensued with reference to the manner of electing new members. Finally the resolution submitted by Dr. Coolidge was adopted. The resolution was as follows:

Proposals for membership should be sent to the Secretary before November 1, signed by at least two Active Fellows of the sociation, who are requested as far as possible to send in also a statement of the medical work done and positions held by the candidate.

The Secretary shall, in November, send by mail to each Active Fellow a ballot containing the name of each candidate proposed, names of his sponsors and a brief statement of his medical work, positions held, and any other data which appear pertinent.

Each Active Fellow shall be requested to mark on the ballot "Yes" or "No" after the name of each candidate for whom he is willing to vote, and he shall be invited to give his opinion, or

to state any facts bearing on the question, of a candidate's admission to the Association. These ballots shall be returned to the Secretary before January 1.

These ballots and accompanying letter shall be considered confidential by the Council.

Nominations shall be made by the Council, and presented to the Association at the annual meeting (as heretofore).

No waiting list shall be kept from year to year, but data transmitted to the Secretary shall be kept by him for reference in case the person to whom they apply again becomes a candidate.

The executive session was then closed and scientific business resumed. Adjournment took place at 1 p. m. The Fellows and their ladies were entertained at lunch by Dr. and Mrs. Richardson at their residence, No. 1317 Connecticut avenue, where they again met the members of the Otological and Climatological societies.

In the evening the annual dinner of the Association was held at the New Willard, Thirty-nine Fellows were in attendance. The occasion was made memorable by the presentation of a silver loving cup to our colleague, Dr. J. Solis-Cohen, in honor of the fiftieth anniversary of his graduation in medicine (see p. 260).

The closing session of the Congress was held on Thursday, May 5, at 9 a. m.

The following resolutions on the death of Dr. King were submitted by a special committee appointed at the opening session:

The American Laryngological Association desires hereby to express its deep sense of the loss which it has sustained in the death of Dr. Gordon King.

To this it desires to add an expression of the profound sorrow which the individual members, personally, so keenly feel as they realize that there has been removed from their midst so highly endowed a confrere and dearly beloved comrade and friend.

(Signed) D. Bryson Delavan,
E. Fletcher Ingals,
H. L. Swain,
Committee.

The report was adopted and ordered printed in the Transactions. A copy was sent to Dr. de Roaldes, the associate of our late colleague.

The reading of papers and discussion thereon was continued till the close of the programme. At 12:30 the Association went into executive session. The following motions were passed:

Voted, That the Treasurer be authorized to borrow a sum not to exceed five hundred dollars to defray the cost of publishing the Transactions for 1910.

Voted, That the thanks of the Association be presented to the directors of the Cosmos Club for courtesies extended during the present Congress.

Voted, That our thanks be extended to our Washington colleagues, Drs. Bryan and Richardson, for their hospitality.

Voted, That the thanks of the Association be extended to the retiring President and Secretary for their work during the closing year.

The report of the Nominating Committee was again read and the Secretary authorized to cast one affirmative ballot for the gentlemen named therein. This was done and they were declared elected. In the absence of the President-elect, the First and Second Vice-Presidents-elect, Drs. Myles and Ingersoll were escorted to the Chair and the former, at 1 p. m., declared the Congress adjourned.

James E. Newcomb, Secretary.

DR. GORDON KING.

As the result of an accident sustained while playing polo, Dr. Gordon King died at New Orleans, La., on the 26th of March of the present year.

Dr. King was born at Tuskegee, Ala., on May 17, 1876. His early school life was spent in Southern Alabama and Louisiana. In 1897 he received his medical degree from Tulane University, New Orleans, and followed this event by an interneship in the Charity Hospital of that city. Then came a winter at Bordeaux in the clinic of our Honorary Fellow, Professor E. J. Moure, at the Hôpital St. André. Returning to New Orleans, he at once associated himself with our colleague Dr. A. W. de Roaldes, a partnership which existed till his death.

The professional activities of our deceased colleague were manifold. He soon became a member of the Orleans Parish Medical Society, the Louisiana State Society, American Medical Association, American Otological Society, and in due time was elected a Corresponding member of the French Society of Laryngology, Rhinology and Otology. In 1901 he was elected to Active Fellowship in our own Association, the title of his Thesis being "The Bucco-Antral Route in Neurectomy for Relief of Tic Douloureux." At that period candidates' theses were not published in the Transactions; hence it does not appear in our own volumes, but may be found in "La Parole" for May, 1902. He at once became a forcible and attractive teacher in his speciality. He was appointed Professor of Laryngology, Rhinology and Otology in the New Orleans Polyclinic, and also in the Medical Department of Tulane University. He was a Special Lecturer in the New Orleans College of Dentistry. His great clinical field, however, was at the New Orleans Eye, Ear, Nose and Throat Hospital, which had been founded by Dr. de Roaldes. Under the guidance of these two men this institution speedily became one of the most prominent in the Southern states and secured an enviable reputation abroad. Its annual reports have always been models of clearness and completeness.

Dr. King had published some fifteen papers outside of those which appear in our Transactions, numbering three. His bibliography is given herewith:

1897. "Cocaine as a Local Anesthetic in Minor Surgery." "Tumors of the Omentum."

1898. "The Ogston-Luc Operation for the Radical Cure of Chronic Suppurative Frontal Sinusitis."—*New Orleans Medical and Surgical Journal, February,* 1898, and *Annals of Otology, February,* 1898. "Chronic Abscess of the Soft Palate." "The Caldwell-Luc Operation for Chronic Maxillary Empyema."

1899. "A Case of Eunuchoid or Falsetto Voice."—*Transactions Louisiana State Med. Soc.,* 1899. "Esophagoscopy: Its Application in Two Cases."

1900. "Report on Two Cases of Foreign Body in the Trachea: Operation: Recovery."—*Transactions Louisiana State Med. Soc.,* 1900. "Report of Twenty-one Cases of Septal Deviation Operation by the Asch Method," "A Case of Hysterical Deaf Mutism."—*The Laryngoscope, St. Louis, November,* 1900. Naso-Pharyngeal Tumors: Report of Case.

1901. "The Influence of Nasal Obstruction on the Development of the Maxillae and Teeth."—*Read before the New Orleans Academy of Stomatology, November 27,* 1901.

1902. "Voie Bucco-Antrale dans la Neurectomie pour la Guérison du Tic Douloureux."—*La Parole, Paris, May,* 1902. "Epistaxis: Its Causation and Treatment."—*Read before the Orleans Parish Medical Society, January 25,* 1902.

1904. "Some Observations of the Treatment of Accessory Sinus Diseases."—*New Orleans Medical and Surgical Journal, February,* 1904. "Etiologie Nasale et Traitement de l'Asthme."—*Revue Hebdomadaire de Laryngologie, d'Otologie, et de Rhinologie.*
Perisinusal Abscess of the Lateral Sinus with Metastasis in the Liver and Sterno-Clavicular Joint.—*Journal American Medical Association, January 2,* 1904.

Dr. King's multifarious activities did not interfere with his devotion to outdoor sports, for it was his ideal to maintain a sound mind in a sound body. He was a fine horseman and an expert at polo, being a member of the New Orleans Polo Club. From a local paper we learn that on the fateful day in question he was riding a spirited horse and had to exercise all his energies to hold him in. In a sudden turn and jump Dr. King was thrown and the animal leaped over his body. His head was caught between the hind hoofs of the animal and his skull fractured. He was hastily taken to the Charity Hospital and an operation performed for depressed fracture. The seriousness of his condition was from the first recognized and in spite of every possible assistance he died at 11 o'clock the same evening, about six hours after the accident. The Secretary was notified

by Dr. Roaldes of his death, and a telegram of sympathy was sent on behalf of the Association.

The latter will not soon cease to mourn his loss. It has been bereft of a beloved friend, a valued colleague and a man of unusually great promise. He had already won his spurs as a clinician of a truly scientific spirit, and at the time of his death occupied a position of great promise and achievement in his chosen specialty. If such be the feeling of the Fellows at large, what shall be said of the bereavement which has come to our esteemed colleague, Dr. Roaldes? Dr. King was to him not only a professional associate, but almost a son and brother as well. He had made the successful association with Dr. Roaldes (whose wife's nephew he was) his aim in life, and strove mightily to render himself worthy of this association. How well he succeeded, the universal testimony at his death is ample evidence. For our bereft colleague our hearts go out in deepest sympathy and to the large circle of friends we tender an assurance of our love and sorrow.

J. E. N.

PRESENTATION OF A LOVING CUP TO DR. J. SOLIS-COHEN.

At the annual dinner of the American Laryngological Association held in Washington, D. C., May 4, 1910, Dr. J. Solis-Cohen, of Philadelphia, was the recipient from the Association of a loving cup, in recognition of his distinguished services to laryngology and in commemoration of the fiftieth anniversary of his graduation in medicine. The presentation address was made by Dr. D. Bryson Delavan, who, introduced by Dr. James E. Logan, president of the association, spoke as follows:

Dear Doctor Cohen:

The Fellows of the American Laryngological Association have considered the present opportunity a fitting one in which to express to you their sentiments.

The fiftieth anniversary of one's embarkation upon a great enterprise must always be an event of unusual interest, especially when the undertaking has been crowned with conspicuous success. The golden wedding, with its rallying of the children, the grandchildren and the great-grandchildren, its revival of the memories of the past, its testimonials of affection and friendship, has a fitting counterpart in the golden jubilee of your espousal of medicine.

To-night, celebrating this historic occasion, we bring to you our greetings and extend to you warmest expressions of friendship and congratulation.

The children of your creation in medical science and art are indeed a numerous family, representing, as they do, the widest range of professional effort. In the departments of invention and of literature no laryngologist has contributed more, while the great army of pupils who have been inspired by the loftiness of your character as well as by your energy, your enthusiasm, your deep learning, and your unrivalled skill, have gone forth into the world of science men of high ethical standards and of advanced professional training. Through them you have lived and are living over and over again that life of high endeavor which they have learned of you and which you yourself have so nobly exemplified.

Entering the field of laryngology in this country in its very infancy you have been a living witness of its unparalleled growth. From an humble and unpopular birth you have watched its development into a thing of dignity, of influence and of power. You have seen the number of its votaries increase until, whereas in your early day there was one, now there are a thousand.

You have seen the clinic which you started, single-handed, expand into an important department in a great institution of learning. More than that, you have seen your pupils and those of your immediate followers going forth throughout the length and breadth of this mighty land, carrying your message in the building up of splendidly equipped infirmaries for the special care of the sick and establishing new centres of special instruction wherever medicine is taught. From nothing you have seen the development of an important department of medical literature. In the management of disease you have verified our motto, "E tenebræ lux."

In this marvellous advance you have been the first and the greatest leader. Literally at the head of the column, there has never been a time in your long march when you were not the acknowledged chief. To-day we, who now desire to honor you, honor ourselves in thus proclaiming you.

No eulogy to you could be as eloquent as the simple record of your life. The example of personal and professional uprightness which you have set has been a veritable beacon light, shining out through the clouded ethics of the time, a sure guide to the doubting and a solace to the honest strivers after truth.

That your experience has been wide and your accomplishments varied are shown by the relation of some from among the many notable incidents of your career. After having gained a substantial education in Philadelphia, both in the arts and in medicine, you made the most of your opportunities as interne at the Pennsylvania Hospital, and then, during the Civil War, entered the service of your country as Acting Assistant Surgeon. In that capacity you served with credit, both in the United States Army and in her Navy. At the close of the war you entered upon the practise of medicine in Philadelphia.

In 1866, almost the very first in America, you began giving private lectures in laryngology at the Philadelphia School of Anatomy. In 1870 you were elected lecturer on laryngoscopy and diseases of the throat and chest in Jefferson Medical College, and later you organized a clinical service in the collegiate courses, abandoning your private clinic and your private lectures. In 1882 you were elected honorary professor of laryngology in Jefferson Medical College, and for many years still

supervised in the throat clinics, until about 1895, when your practically retired from teaching. In 1883 the Philadelphia Polyclinic and College for Graduates was established, and, as one of the founders, you became professor of diseases of the throat and chest. In connection with this you established a Laryngological Clinic, which you supervised for several years, retiring as Emeritus Professor.

In the early days of laryngology it remained for three English-speaking authorities to place the department of laryngology and rhinology upon a firm, scientific basis. The first of these was yourself. Your classical work, published in Philadelphia in 1872, gave a full exposition of the subject to date. It was far more complete and comprehensive than anything which had yet appeared, and as a practical guide was without a rival. No book has ever had a greater influence in disseminating a wide and comprehensive knowledge of laryngology than yours.

The vast number of your original contributions to literature have been marked by the originality, the clearness, the wisdom and the scientific accuracy which distinguish you.

Together with Louis Elsberg, Frederick Irving Knight and George Morewood Lefferts, you founded and edited "The Archives of Laryngology," the first and the best special journal of laryngology ever published in the United States.

Your inventions have been many and valuable. You have devised and adapted instruments and methods for the treatment of conditions at the time hardly recognized by others, in some instances antedating claims of priority by many years.

As an operator you were twenty years before your contemporaries in the surgical treatment of the nasal sinuses. You excelled in the surgery of the upper air passages in general, both major and minor, in all of its branches. To your credit belongs the first really successful complete laryngectomy performed in America, introducing into this country in the course of it the now well recognized method by which the severed end of the trachea is caused to emerge from the lower part of the neck.

In the highest sense a specialist, you have shown that your knowledge of medicine in general is wide and profound, and that no one of your time appreciates as do you the importance of the association of general medicine with special.

Here in the American Laryngological Association, the first by many years of the associations of its kind, your influence has been pre-eminent. Its most illustrious founder, through an excess of generosity you were nominally its second president, although actually its first, and the two meetings held under you

as presiding officer actually marked the beginning of the brilliant record of its history. At those meetings, thanks to the force of your example and precept, standards were set in ethics, in organization and in scientific excellence which, followed by those who have succeeded you, have placed our Association foremost among its kind. At that time the department of laryngology was unformed. Its many scattered elements, although showing strength and the promise of vigorous growth, were disjointed, its state chaotic. The situation required the help of one possessing your peculiar power of organization and of reconciliation.

Your success at this time in uniting elements which might have become discordant has placed your successors under an obligation the weight of which they little realize.

Unlike some of your colleagues the light of your enthusiasm for the Association has burned bright and clear from that early day until this. No one has been its more staunch and earnest friend in times past and none to-day remains more loyal.

This record of long continued, active, untiring interest is one which we heartily acknowledge and for which we earnestly testify our appreciation.

In the long course of your practice of medicine, both public and private, you have extended to your patients, whose numbers no man can estimate, unspeakable kindness, sympathy and liberality. It is here more than anywhere else that you have distinguished yourself. Yours has indeed been the career of the true-hearted friend, the good physician. And now, after all these years of service, the memory of your devotion to others must be the brightest gem in your well-earned crown.

Who has done as well in so many different directions? Not one of all your contemporaries. Certainly no one of later date.

We honor you, however, not so much because of what you have done as for what you are. From the beginning to the end of your long, useful and brilliant career, self-seeking, arrogance and unworthy ambitions have been to you unknown. Yours has been the modesty of conscious worth. Eminently forgetful of self, you have striven to enlighten, to improve and to help. Your life has been one long-continued story of earnest, enduring, heroic effort to raise your fellow beings to higher planes of thought and action, to relieve suffering and to better the conditions of mankind. With this end in view you have labored cheerfully, consistently, with all unselfishness and with unremitting zeal for fifty years. The motives of your actions have been as clear as crystal. Those around you have recognized in you the SCIENTIST, the PATRIOT, the HUMANITARIAN. They have quickly appreciated you as an unspoiled man of the world, a gen-

erous rival and a devoted friend. Some of them have known of the varied burdens which have accompanied your life. They have seen you pass through deep waters, through trying experiences of professional endeavor and through those inevitable currents and whirlpools of difficulty which must confront the pioneer in all great work. They have realized the purity and the integrity of your purpose, the undaunted courage which has sustained you, the calm serenity with which you have met every decree of fate. They have recognized in you a broad and philosophical mind and, above all, a spirit of tolerance, of kindliness and of devotion to the interests of those about you and to the world at large which has placed you among the foremost benefactors of our time.

We respect you for the qualities of your mind and character. The qualities of your heart have won from us our deepest affection. You are well named the Nestor of American Laryngology, although I doubt not that if Homer had possessed the knowledge of you which I am happy to say belongs to us, he would have pictured Nestor with even greater dignity and force.

While not forgetting all of your other achievements and attributes it is the sense of personal regard for you which dominates us to-night. A great honor has been placed upon me in the privilege which I now have of representing, in the presentation of this testimonial, those who know you the best and who respect you the most. I but poorly represent the sentiments which they would express, but in their names I present it to you, with a heart brimming over with affection. We appreciate you and we want you to know it, and that in no uncertain terms. We love you and wish you to feel it with all possible power. We realize what you have done for us and for the world in the past. We desire to add if possible to the contentment and happiness of your present. For the future we pray for you every possible blessing of health, prosperity and peace.

And now, in the name of the American Laryngological Association, I present to you this gift, offered you as the inscription upon it reads, "in recognition of your distinguished services to Laryngology and in commemoration of the Fiftieth Anniversary of your graduation in Medicine."

May these words be an enduring record of your fame and may the sentiments suggested by the cup itself inspire and comfort you throughout many a golden year to come.

Dr. Cohen replied in the following words:

Mr. President, Dear Doctor Delavan, and all you other Fellows of the American Laryngological Association:

You can well comprehend that this is one of the proudest moments of my professional life. My heartfelt thanks well out to you in waves of emotion deeper than I am able properly to voice them. Furthermore, the sweet-voiced tone and tenor of your spokesman's fond laudation has so charmed away the memory of what I intended to say that you must permit me to read it from the manuscript.

Of all the relations in which human beings may reciprocate sentiment, none is more genuine than cordial affection exhibited between men, in witness whereof this loving cup of which I am the recipient in commemoration of the completion of my fiftieth year as a graduate in medicine.

Allow me to pass the cup around the table and request each of you to handle it, so that when it returns to me I may, as it were, feel the impress of all your hands in fond commingling unison.

Many a physician fully entitled to special honors from his colleagues passes away ere a suitable occasion is presented for tendering them, and he dies without having realized the appreciation in which he was held; but it has been my good fortune to have lived long enough to have received several proofs of fondness this year from my medical friends and associates. Firstly, on March 15th last, the fiftieth anniversary of my graduation in the Medical Department of the University of Pennsylvania, I was given a banquet by the Laryngo-otological Section of the College of Physicians of Philadelphia and a number of former assistants in my clinics; and, just as the toast were announced, a long box of full blown roses—American Beauties—was presented me with the compliments of a doctor and his wife of the name of Love. That date, March 15th, marked, likewise, the thirtieth similar anniversary of two members of the committee on the banquet, both former associates in my clinical services, and both members of this association, the deft-fingered Dr. Watson and the burlier figured Dr. Gibb.

On April 11th I was guest of honor at the annual banquet of the Northern Medical Association of Philadelphia, of which I had been president in 1875, and during the function was presented with fifty half-blown roses—half blown, it was said on their presentation, to indicate that my professional career was only half through.

To-night I am happy in the possession of a substantial token of the fondness of my brother Fellows of the American Laryn-

gological Association, to last in evidence as long as the imperishable precious material of which it is fashioned—to last, I trust, forever.

On my return home from this meeting it will be shown first to my immediate family, then it is to be taken to my beloved mother, aged, but still youthful in heart and in intellect, to whom I have promised to bring it as soon as I could; and then some disposition will be made to provide for its permanent preservation, probably, if practicable, in the Army Medical Museum in this city of Washington, in which it has been given to me. Thus shall my name, linked with the name of the American Laryngological Association as inscribed upon this loving cup, record to posterity our love for each other as long as the museum shall exist.

Perhaps in no medical society has mutual fondness among its members, based upon mutual fondness for the same subjects of study and work, been more apparent than in this American Laryngological Association. Thirty-three years ago—a generation ago—it was organized in a blaze of enthusiasm by a score or so of ardent students and practitioners of Laryngology and its cognate branches, sanguine in the success of their project to place the too little appreciated specialty upon a secure and firm basis. That enthusiasm has been continued by them and their successors to the present; and may it be continued as long as the organization exists.

From the very first annual meeting, as the published records of the Transactions attest, the highest standard of ethical conduct and scientific work was aimed at. This standard was bravely sustained in subsequent meetings, and in a very few years the American Laryngological Association was held in great esteem the world over.

In the earlier years of our organization it was deemed wise to keep the number of Fellows within certain limits, so as to invite the co-operation chiefly of those eminently fitted for membership. But the study of Laryngology and its allied subjects extended so rapidly that soon a sort of daughter society was organized—perhaps it was rather a sort of stepdaughter society—a society that eventually attracted a number of our own members, and which has more recently furnished a number of accessions to this association. And the enthusiasm of that society soon outran in one direction the enthusiasm of the step-parent. Its numbers were not limited, and increased with such rapidity that soon branch societies were organized in the North, in the East, in the South and in the West; and so, in addition to the annual meetings of the society in chief, each of its four sections

has an additional annual meeting—and their industry and the scientific work of each year is proportionately increased.

Laryngology is to-day reared on a secure basis, and is in the best repute everywhere. Much of this has been due to the work of the American Laryngological Association as a whole, and to the individual work of its members, their students, their students' students, and their other followers. This claim can be maintained without any depreciation of the excellent work that has been done and is being done by our predecessors and colleagues on the Continent of Europe and in the Isles of Great Britain.

To those of you who have taken up Laryngology since it has become a safe procedure, it may be difficult to realize the obstacles encountered by the older ones who struck out into the new path when specialties as a rule, were regarded by many practitioners with little favor, and by the bulk of the profession with no favor at all. We were looked upon, at least in America, with such contumely that we were barely tolerated as honest and reliable practitioners of medicine.

The earliest laryngologists of these United States, at least in Philadelphia, were considered by many of their colleagues as semi-demi-charlatans, or at least as charlatanoids—as one distinguished and witty member of the profession dubbed us. As for myself, I was blackballed in the Academy of Natural Sciences of Philadelphia, much to the surprise of its presiding officer, himself the editor of the American Journal of the Medical Sciences, by a few of the medical members who declared me to be engaged in unethical practice, and who had gathered in sufficient numbers purposely to effect my exclusion, and thus punish my presumption. Subsequently I was duly elected, however.

Another instance: Once, when I was in the amphitheatre during a surgical clinic at one of our medical schools, the surgeon on duty introduced me to his class as a man fast leaving the ranks of legitimate practice to become engaged in a narrow specialty. "Why," said he, "he devotes most of his time to a cubic inch of the human anatomy," and then he added, "Some day I suppose we will have specialists confining themselves to diseases of the navel." Nevertheless, the time came when that surgeon sent for me year after year to lecture for him on methods of examining the upper air passages when that portion of his course was reached; and when he revised the last edition of his famous System of Surgery, I wrote, at his special request, the chapters on Surgery and Surgical Diseases of the Air Passages. He sent me a substantial check for the service, which I returned with a note stating that I had written them for love

alone; and then he sent me a charming letter of thanks in reply and two baskets of champagne. That man's statue has been erected here in Washington on the grounds of the Smithsonian Institution. Not in consequence of the acknowledgement of his incorrect estimate of laryngology, but in due sequence. He was a great man, a great surgeon, and his very name was GROSS.

But the years of tribulation have long since passed, and when more than two decades ago this Congress of American Physicians and Surgeons was established, in one of whose triennial meetings at the Capital of the Nation we are now participating, the American Laryngological Association was welcomed as one of its most important components.

May it retain forever the high position it has acquired, and may each Fellow of you in your turn reach your fiftieth medical anniversary in as good health and vigor as merciful Providence has vouchsafed to me, and may you receive as complimentary a memento of the occasion.

ACTIVE FELLOWS.

1911.

1906. Ballenger, William L., Columbus Memorial Building, Chicago, Ill.
1908. Barnhill, John F., Pennway Building, Indianapolis, Ind.
1880. Bean, C. E., Germania Life Bldg., St. Paul, Minn.
1904. Berens, T. Passmore, 35 Park Ave., New York.
1893. Birkett, Herbert S., 252 Mountain St., Montreal.
1893. Bliss, Arthur Ames, 117 South 20th St., Philadelphia, Pa.
1878. Bosworth, Francke H., 41 Park Ave., New York.
1901. Brown, J. Price, 37 Carlton St., Toronto, Can.
1892. Brown, Moreau R., 34 Washington St., Chicago, Ill.
1891. Bryan, Joseph H., 818 17th St., Washington, D. C.
1889. Casselberry, William E., 34 Washington St., Chicago, Ill.
1896. Chappell, Walter F., 7 East 55th St., New York.
1897. Clark, J. Payson, 71 Marlborough St., Boston, Mass.
1902. Coakley, Cornelius G., 53 West 56th St., New York.
1899. Cobb, Frederic C., 11 Marlborough St., Boston, Mass.
1905. Coffin, Lewis A., 156 West 58th St., New York.
1878. Cohen, J. Solis-, 1824 Chestnut St., Philadelphia, Pa.
1893. Coolidge, Algernon, Jr., 613 Beacon St., Boston, Mass.
1882. DeBlois, Thomas Amory, 48 Gloucester St., Boston, Mass.
1881. Delavan, D. Bryson, 1 East 33d St., New York.
1892. Farlow, John W., 234 Clarendon St., Boston, Mass.
1901. Freeman, Walter J., 1832 Spruce St., Philadelphia, Pa.
1905. Freer, Otto T., 34 Washington St., Chicago, Ill.
1879. French, Thomas R., 150 Joralemon St., Brooklyn, N. Y.
1897. Frothingham, Richard, Sydenham Bldg., Madison Ave. and 58th St., New York.

1909. Getchell, Albert C., 6 Linden St., Worcester, Mass.
1907. Gibb, Joseph S., 1907 Chestnut St., Philadelphia, Pa.
1880. Gleitsmann, Joseph W., Sydenham Building, Madison Ave. and 58th St., New York.
1898. Goodale, Joseph L., 258 Beacon St., Boston, Mass.
1905. Grayson, Charles P., 251 South 16th St., Philadelphia, Pa.
1906. Greene, D. Crosby, Jr., 483 Beacon St., Boston, Mass.
1905. Halsted, Thomas H., 831 University Block, Syracuse, N. Y.
1896. Hardie T. Melville, 34 Washington St., Chicago, Ill.
1903. Harris, Thomas J., 117 East 40th St., New York.
1878. Hartman, Jacob H., 5 West Franklin St., Baltimore, Md.
1888. Hinkel, F. Whitehill, 581 Delaware Ave., Buffalo, N. Y.
1907. Holmes, Christian R., 8 East 8th St., Cincinnati, Ohio.
1893. Hope, George B., 159 West 72d St., New York.
1895. Hopkins, Frederick E., 25 Harrison Ave., Springfield, Mass.
1895. Hubbard, Thomas, 541 Nicholas Building, Toledo, Ohio.
1901. Hyatt, Franck, 1022 14th St., N. W., Washington, D. C.
1878. Ingals, E. Fletcher, 36 Washington St., Chicago, Ill.
1904. Ingersoll, John M., Osborn Building, 1021 Prospect St., Cleveland, Ohio.
1907. Jackson, Chevalier, 1018 Westinghouse Building, Pittsburg, Pa.
1878. Johnston, Samuel, 204 West Monument St., Baltimore, Md.
1885. Knight, Charles H., the St. Hubert, 120 West 57th St., New York.
1898. Kyle, D. Braden, 1517 Walnut St., Philadelphia, Pa.
1880. Langmaid, Samuel W., 277 Dartmouth St., Boston, Mass.
1878. Lefferts, George Morewood, 212 Madison Ave., New York.
1894. Leland, George A., 354 Commonwealth Ave., Boston, Mass.

1903. Lincoln, William, 210 Lennox Bldg., Cleveland, Ohio.
1897. Logan, James E., 1208 Wyandotte St., Kansas City, Mo.
1888. Lowman, John H., 1807 Prospect Ave., S. E., Cleveland, Ohio.
1886. MacCoy, Alexander W., 216 South 15th St., Philadelphia, Pa.
1883. Mackenzie, John N., 605 Washington Place, Baltimore, Md.
1898. Makuen, G. Hudson, 1627 Walnut St., Philadelphia, Pa.
1896. Mayer, Emil, 25 East 77th St., New York.
1899. McKernon, James F., 62 West 52d St., New York.
1904. Mosher, Harris P., 828 Beacon St., Boston, Mass.
1901. Myles, Robert C., 46 West 38th St., New York.
1893. Newcomb, James E., 118 West 69th St., New York.
1903. Packard, Francis R., 304 South 19th St., Philadelphia, Pa.
1906. Pierce, Norval H., 31 Washington St., Chicago, Ill.
1878. Porter, William, 3886 Washington Ave., St. Louis, Mo.
1908. Randall, B. Alexander, 1717 Locust St., Philadelphia, Pa.
1903. Renner, W. Scott, 341 Linwood Ave., Buffalo, N. Y.
1897. Rhodes, J. Edwin, 100 State St., Chicago, Ill.
1884. Rice, Clarence C., 123 East 19th St., New York.
1905. Richards, George L., 84 North Main St., Fall River, Mass.
1902. Richardson, Charles W., 1317 Connecticut Ave., Washington, D. C.
1893. Roaldes, Arthur W. de, 624 Gravier St., New Orleans, La.
1879. Roe, John O., 44 Clinton Ave., South, Rochester, N. Y.
1907. Shambaugh, George E., 100 State St., Chicago, Ill.
1909. Shurly, Burt R., 32 Adams Ave. W., Detroit, Mich.
1878. Shurly, Ernest L., 32 Adams Ave. W., Detroit, Mich.
1909. Sluder, Greenfield, 3542 Washington Ave., St. Louis, Mo.
1892. Simpson, William K., 952 Lexington Ave., New York.
1908. Smith, Harmon, 44 West 49th St., New York.

1889. Swain, Henry L., 232 York St., New Haven, Conn.
1903. Theisen, Clement F., 172 Washington Ave., Albany, N. Y.
1892. Thrasher, Allen B., The Groton, 7th and Race Sts., Cincinnati, Ohio.
1892. Wagner, Henry L., Pacific Union Club, San Francisco, Cal.
1892. Watson, Arthur W., 126 South 18th St., Philadelphia, Pa.
1908. Wilson, J. Gordon, 5221 Hibberd Ave., Chicago, Ill.
1906. Winslow, John R., 114 West Franklin St., Baltimore, Md.
1905. Wood, George B., 129 South 18th St., Philadelphia, Pa.
1890. Wright, Jonathan, 44 West 49th St., New York.

HONORARY FELLOWS.

1910. Chiari, Ottokar, Bellariastrasse 12, Vienna, Austria.
1909. Fraenkel, B., Lennestrasse 5, Berlin W. 9, Germany.
1910. Massei F., 4 Piazza Municipio, Naples, Italy.
1910. Moure, E. J., 25 Cours du Jardin Public, Bordeaux, France.
1909. Semon, Felix, Rignall, Great Missenden, Bucks, England.

CORRESPONDING FELLOWS.

1880. Bruns, Paul, Tübingen, Wurtemberg, Germany.
1901. Collier, Mayo, 145 Marley St., Cavendish Square, London W., England.
1890. De La Sota y Lastra, R., 7 Calle de Torqueros, Seville, Spain.
1893. Desvernine, C. M., Cuba 52, Havana, Cuba.
1901. Grant, Dundas, 18 Cavendish Square, London W., England.
1902. Heymann, Paul, 60 Lützowstrasse, Berlin W., Germany.

1908. Killian, Gustav, Freiburg-im-Breisgau, Germany.
1892. Krause, H., San Remo, Italy.
1902. Lermoyez, Marcel, 20 Rue de la Boetie, Paris, France.
1897. Luc, H., 54 Rue de Varenne, Paris France.
1903. McBride, P., 16 Chester St., Edinburgh, Scotland.
1896. Macdonald, Greville, 85 Harley St., Cavendish Square, London W., England.
1894. Macintyre, John, 179 Bath St., Glasgow, Scotland.
1896. Mygind, Holger, 31 Havnegade, Copenhagen, Denmark.
1901. Natier, Marcal, 12 Rue Caumartin, Paris, France.
1910. Navratil, Emerich von, IV Yaaczi-utcza 40, Buda-Pesth, Hungary.
1903. Onodi, A., o'Uctza 12, Buda-Pesth, Hungary.
1910. Retih, Leopold, IX Garnisongasse 7, Vienna, Austria.
1894. Sajous, C. E., 2043 Walnut St., Philadelphia, Pa.
1896. Schmiegelow, Ernest, 18 Nörregade, Copenhagen, Denmark.
1902. Thomson, St. Clair, 28 Queen Anne St., Cavendish Square, London W., England.
1903. Tilley, Herbert, 72 Harley St., Cavendish Square, London W., England.
1901. Wingrave, Wyatt, 11 Devonshire St., Portland Place, London W., England.
1894. Wolfenden, R. Norris, 76 Wimpole St., Cavendish Square, London W., England.

PAST OFFICERS.

Presidents.

(Year of Election.)

1879. Louis Elsberg.
1880. J. Solis-Cohen.
1881. F. I. Knight.
1882. G. M. Lefferts.
1883. F. H. Bosworth.
1884. E. L. Shurly.
1885. Harrison Allen.
1886. E. Fletcher Ingals.
1887. R. P. Lincoln.
1888. E. C. Morgan.
1889. J. N. Mackenzie.
1890. W. C. Glasgow.
1891. S. W. Langmaid.
1892. M. J. Asch.
1893. D. B. Delavan.
1894. J. O. Roe.
1895. W. H. Daly.
1896. C. H. Knight.
1897. T. R. French.
1898. W. E. Casselberry.
1899., Samuel Johnston.
1900. H. L. Swain.
1901. J. W. Farlow.
1902. J. H. Bryan.
1903. J. H. Hartman.
1904. C. C. Rice.
1905. J. W. Gleitsmann.
1906. A. W. de Roaldes.
1907. H. S. Birkett.
1908. A. Coolidge, Jr.
1909. J. E. Logan.

Vice-Presidents.

1879. F. H. Davis.
1880. W. C. Glasgow, J. O. Roe.
1881. E. L. Shurly, W. Porter.
1882. C. Seiler, E. F. Ingals.
1883. S. W. Langmaid, S. Johnston.
1884. J. H. Hartman, W. H. Daly.
1885. H. A. Johnson, G. W. Major.
1886. E. C. Morgan, J. N. Mackenzie.
1887. J. N. Mackenzie, S. W. Langmaid.
1888. W. C. Glasgow, C. E. Sajous.

1889. E. Holden, C. E. Bean.
1890. J. O. Roe, J. H. Hartman.
1891. M. J. Asch, S. Johnston.
1892. S. Johnston, J. C. Mulhall.
1893. J. C. Mulhall, W. E. Casselberry
1894. C. C. Rice, S. H. Chapman.
1893. J. C. Mulhall, W. E. Casselberry.
1894. C. C. Rice, S. H. Chapman.
1895. J. Wright, A. W. de Roaldes.
1896. T. M. Murray, D. N. Rankin.
1897. A. W. MacCoy, H. S. Birkett.
1898. J. W. Farlow, F. W. Hinkel.
1899. T. A. DeBlois, M. R. Brown.
1900. H. L. Wagner, A. A. Bliss.
1901. J. W. Gleitsmann, D. Braden Kyle.
1902. G. A. Leland, T. Melville Hardie.
1903. J. H. Lowman, W. Peyre Porcher.
1904. Thomas Hubbard, W. J. Freeman.
1905. J. L. Goodale, C. W. Richardson.
1906. G. H. Makuen, A. B. Thrasher.
1907. J. P. Clark, J. E. Rhodes.
1908. E. Mayer, F. R. Packard.
1909. C. G. Coakley, H. P. Mosher.

Secretaries and Treasurers.

1879. G. M. Lefferts.
1882. D. B. Delavan.
1889. C. H. Knight.
1895. H. L. Swain.
1900. J. E. Newcomb.

Librarians.

1879. F. H. Bosworth.
1883. T. R. French.
1903. J. H. Bryan.

PAST MEMBERS.

Honorary Fellows.

*1883. Senor Manuel Garcia, London, England.
*1883. Sir Morell Mackenzie, London, England.
*1907. Leopold von Schroetter, Vienna, Austria.

Corresponding Fellows.

*1892. Lennox Browne London, England.
‡1896. Ottokar Chiari, Vienna, Austria.
‡1904. B. Fraenkel, Berlin, Germany.
*1887. A. Gouguenheim, Paris, France.
*1894. Edgar Holden, Newark, N. J.
*1891. Carlo Labus, Milan, Italy.
‡1892. Ferdinando Massei, Naples, Italy.
‡1887. E. J. Moure, Bordeaux, France.
‡1881. Sir Felix Semon, Bucks Co., England.

Active Fellows.

*1880. Harrison Allen, Philadelphia, Pa.
*1878. Morris J. Asch, New York.
1895. J. E. Boylan, Cincinnati, Ohio.
*1883. C. W. Chamberlain, Hartford, Conn.
*1882. S. Hartwell Chapman, New Haven, Conn.
1884. S. Solis-Cohen, Philadelphia, Pa.
1880. E. W. Cushing, Boston, Mass.
1878. Ephraim Cutter, Boston, Mass.
*1880. W. H. Daly, Pittsburgh, Pa.
*1878. F. H. Davis, Chicago, Ill.
*1901. E. T. Dickerman, Chicago, Ill.
*1878. Frank Donaldson, Baltimore, Md.
*1878. William Carr Glasgow, St. Louis, Mo.
*1879. Edgar Holden, Newark, N. J.

*1882. Franklin H. Hooper, Boston, Mass.
1882. Frank L. Ives, New York City.
*1878. Hosmer A. Johnson, Chicago, Ill.
*1879. Woolsey Johnson, New York City.
*1880. William C. Jarvis, New York City.
1879. R. H. Kealhofer, St. Louis, Mo.
*1901. Gordon King, New Orleans, La.
*1878. Rufus P. Lincoln, New York City.
1881. G. W. Major, Montreal, Canada.
1879. Charles McBurney, New York City.
1885. H. Clinton McSherry, Baltimore, Md.
*1881. E. C. Morgan, Washington, D. C.
*1886. J. C. Mulhall, St. Louis, Mo.
1892. T. Morris Murray, Washington, D. C.
*1881. H. Mynter, Buffalo, N. Y.
*1895. J. E. H. Nichols, New York City.
1879. H. K. C. Oliver, Boston, Mass.
1894. William H. Park, New York City.
1892. W. Peyre Porcher, Charleston, S. C.
*1880. D. N. Rankin, Allegheny, Pa.
1881. J. M. Robertson, Detroit, Mich.
1878. Beverly Robinson, New York City.
*1878. T. F. Rumbold, St. Louis, Mo.
†1880. Charles E. Sajous, Paris, France.
*1879. Carl Seiler, Scranton, Pa.
*1893. Charles M. Shields, Richmond, Va.
*1879. Andrew H. Smith, Geneva, N. Y.
1879. Bernhard Tauber, Cincinnati, Ohio.
*1899. Max Thorner, Cincinnati, Ohio.
1888. S. O. Van de Poel, New York City.
1878. Clinton Wagner, New York City.
1896. Marshall R. Ward, Pittsburg, Pa.
1879. Whitfield Ward, New York City.
*1886. Benjamin F. Westbrook, Brooklyn, N. Y.
1896. Greene V. Woollen, Indianapolis, Ind.

---

*Deceased. †Corresponding Fellow. ‡Honorary Fellow.

RF
1
A5
v.32
Biological
& Medical
Serials

American Laryngological
Association
Transactions of the
annual meeting

PLEASE DO NOT REMOVE
CARDS OR SLIPS FROM THIS POCKET

UNIVERSITY OF TORONTO LIBRARY

STORAGE